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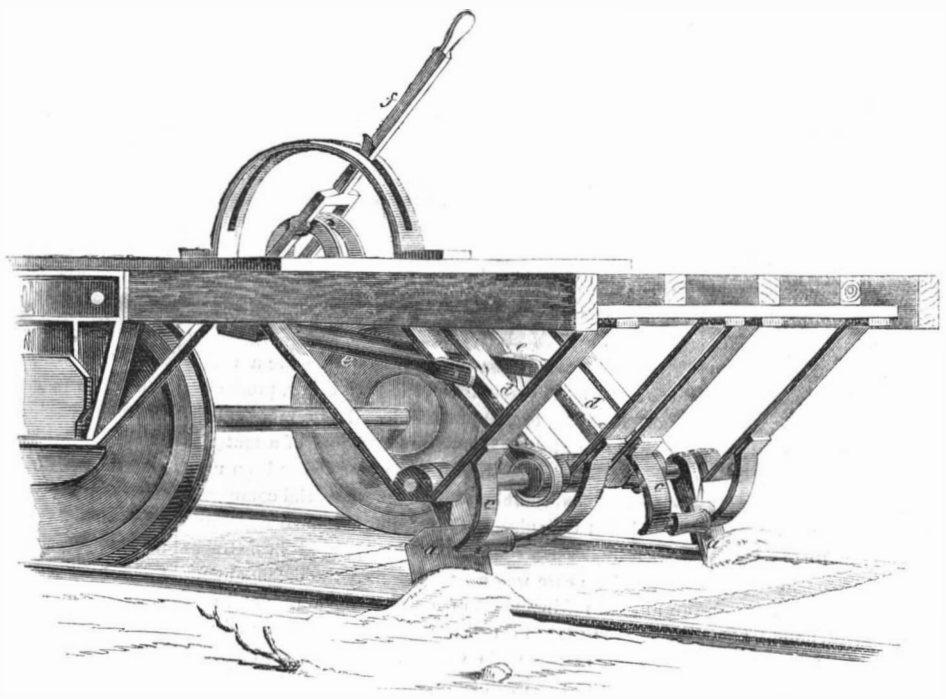
IMPROVED SNOW PLOW.

After snow has been removed by an ordinary large snow plow from the upper surface of railroad tracks there remains a quantity between the rails, coming up to a level with their upper surfaces, and of course occupying the track of the flange of the wheel along the inner side of each rail. To clear these tracks for the flange is the use of the plow here illustrated. It was in use last winter on the Watertown and Rome Railroad, and the officers of the road certify that it operated in a perfectly successful and satisfactory manner.

Two scrapers, *a a*, are suspended below the bottom of a car platform in such position as to run along the inner side of the rail, and throw the snow over the rail outside of the track. These scrapers are inclined at the proper angle to perform this operation, and they are so secured to the car as to yield to any rigid obstacle which they may encounter in their course. This is accomplished by attaching them to the shafts, *b b*, which are turned forward by coiled springs, the braces, *c c*, serving as stops to prevent the scrapers from being pressed too far forward by the springs. The shafts, *b b*, have a little longitudinal play to enable the scrapers to pass freely around curves in the track. Arms, *d d*, are attached rigidly to the shafts, *b b*, and are connected by the rods, *e e*, to the lower end of the lever, *f*, so that, by carrying this lever back in its curved guides, the scrapers, *a a*, are turned up back out of the way when they are not needed.



HUNTINGTON'S IMPROVED SNOW PLOW.

It will thus be seen that this is a very simple and efficient implement, and that all the obstacles likely to be encountered in its operation have been foreseen and guarded against.

The patent for this invention was granted (through the Scientific American Patent Agency) June 21, 1860, and further information in relation to it may be obtained by addressing the inventor, W. S. Huntington, at Andrusville, N. Y.

REARING CHILDREN PHYSIOLOGICALLY.

We find the following sensible remarks in the *Scalpel*:—

All the absolute evils of this world may be said to arise from ignorance and selfishness; perhaps all might be included in the word selfishness, if we give to that term its full and broad signification. Even our purest affections in their manifestation seem often only a desire to please ourselves, without reference to any result beyond the present. There is throughout the world a lack of perception of separate individuality, and of the consequences to that other being, of any course we may pursue. Among men the results of the acts of individuals toward each other and upon the community, have given rise to legislation and to laws.

In each separate family pater-familias (sometimes indeed it is *mater*-familias) constitutes himself and his various moods, the law by which his household is governed; and in many cases his daily emotions of anger or pleasure, disappointment or success, render his rule benign and considerate, or harsh and tyrannical. Many again there are, who, by a steady, moral, unwavering mind, guide the household affairs, and the development of those youthful minds which God has intrusted to their care. To these, and to all, we address ourselves. It is impossible to instruct and develope correctly any two children by the same course of treatment; it is vain to make any system a Procrustean bed; it is inconsistent with the advance of humanity and with true individuality. While in morals there may be an absolute right and wrong, an unwavering adherence to the good and the true, the peculiar method of attainment to this rule is as varied as the minds upon the earth.

The natural faculties of each child are as plain to careful observation as the sun at noon-day; and it is only necessary to know the mental bias of a child to enable us properly to determine the situation in life to which his or her powers are best adapted.

Let every father, every mother, and all who hope to call themselves parents, forever bear this in mind. Watch the child at its *play*. Suffer it to play as it will, and note what sports attract it, wherein lies the chief pleasure.

Away with those horrors, infant phenomena. Let nature alone, and do you, ignorant man, keep your great, coarse finger out of the delicate machinery, which, working by and through nature, will, at the proper moment, indicate the course to be pursued, the development which is sought. Permit childhood to guide you in the treatment thereof. Nature is a wise teacher.

At infancy, the healthy body, incapable of progressive motion, demands rest; give then perfect quiet. Man's early life is a mere vegetative existence; the brain, gently pulsating beneath the unformed bone, is not yet the seat of reason, but of instinct; while nature then demands entire repose, or, at the most, passive action, why should a barbarous nurse and ignorant mother array the little form in thick embroidery; display it to the admiring multitude; dandle it with thumping vibration, or spin it like a boomerang in the air? Why seek the most noisy promenade to confuse it with the uproar? Why pound it up and down over hundreds of miles, in the midst of smoke, effluvia, and all the rattle, noise and screams incident to railroad travel? Avoid those abominations called cradles; flee from the rocking of the crib, and all those swinging motions which cannot fail to produce, in a minor degree, those very agreeable sensations, that pleasant lethargy, which seizes upon one when he is taking his first lesson in drunkenness. What a renown would that agriculturist win for himself who should first invent a patent, portable, double action, self-rocking cradle for sucking calves; what an advantage to the bovine race!

When by pure air, and its natural nourishment, [the pure milk of a cow, or a goat, is far better than that of a feeble, passionate, or drunken nurse, when the mother cannot nurse her offspring,] the child has become old enough to creep about, down on the floor with it, and let it go; give it a ball or something to creep after, and rest fully content that when tired, the child will ease its play.

Don't hurry the little one to walk; do not encourage it to stand alone, lest bow-legs and weak ankles be the penalty of your too assiduous care, of your selfish desire to see your child walk before nature has decreed it. When the proper time arrives the little hands will seek the tops of chair-seats, the little body will sway to and fro, erect for the first time; soon the first step is taken, and then all is plain.

Keep your books, your illuminated alphabet, your intellectual blocks, and your abortions of toys—caricatures upon nature—toys which it is no harm to fall down and whorship, since the like thereof exists neither in heaven above, nor in earth beneath, nor in the water which is under the earth. Let the child play one, two, three; what, says some one—four years! and not know a letter! Yea, my good madam, even until it reacheth the age of seven years, would we have the little mind free and unpuzzled; at liberty to observe, to desire, to construct, to play, to make out its own individuality. This is the great attribute of man—play; this divides him from the brute creation; man alone can laugh. Remember that the longer the period of youth, the period of formation, the better, the more healthful, enduring, and longer-lived the man. Of all created beings man is the most helpless at infancy.

THE metal platinum, when massive, is of a lustrous white color; but it may be brought, by separating it from its solutions, into so finely divided a state, that its particles no longer reflect light, and it forms a powder as black as soot. In this condition it absorbs more than 800 times its volume of oxygen gas, and this oxygen must be contained within it in a state of condensation greater than that of liquid water.

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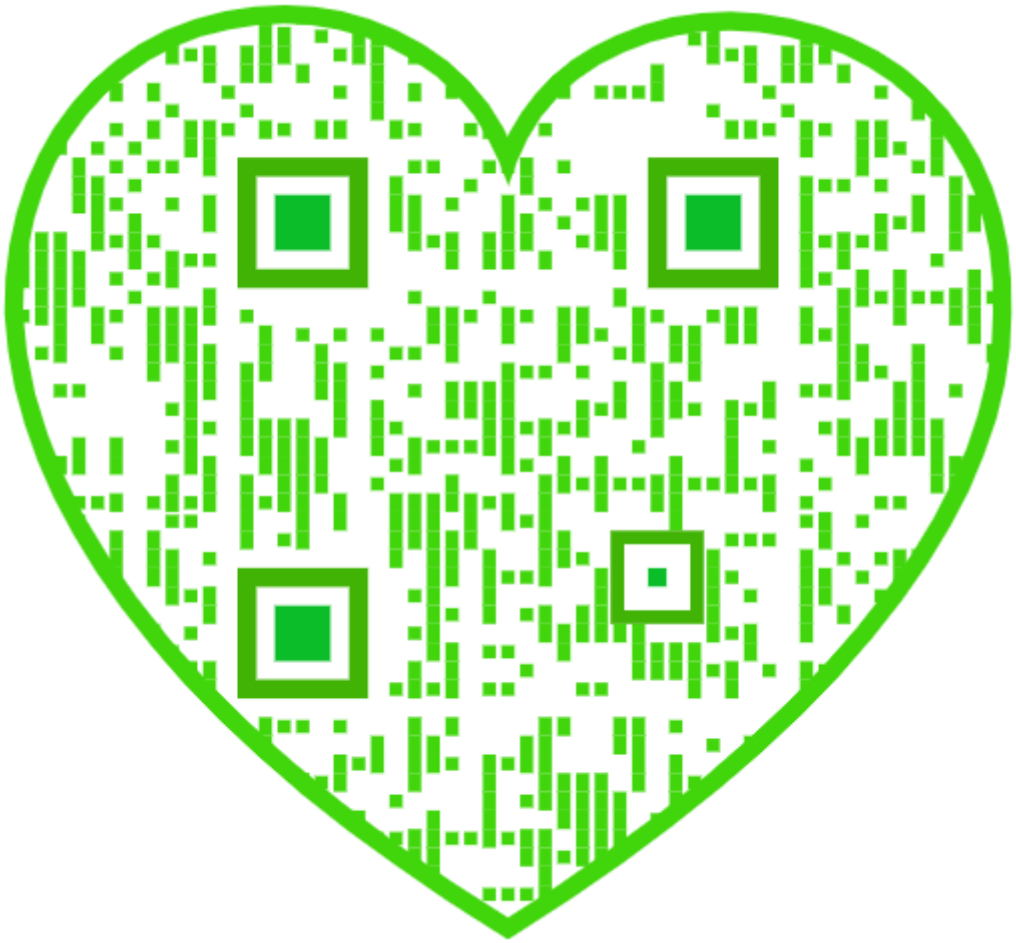

FRICTION MATCHES.

[From Appleton's American Cyclopædia.]

Among rude nations fire was obtained by rubbing together two pieces of dried wood; and the practice among civilized people has been to procure it by the flint and steel, catching the particle of steel struck off and rendered red-hot by the friction in dry and highly inflammable tinder. To this succeeded the use of phosphorus, which in 1680, a few years after its first discovery, was introduced for this purpose in London by Godfrey Hanckwitz, who applied it by rubbing it between folds of brown paper till it took fire; it was then made to ignite a stick, one end of which had been dipped in sulphur, and which may be considered the the earliest form of the common match. The cost of the phosphorus, however, prevented its general use either in this form or in several others contrived for the same purpose. One of the most successful of these was to partially burn a bit of phosphorus in the confined air of a small vial, the effect of which was to line it with the oxyd of phosphorus; the vial was then corked, and when required for use a sulphur match was dipped into it; the match was thus ignited by the chemical action thus produced, or by afterward rubbing it upon a piece of cork. Another form extensively used were called chemical matches, and were sold in little cases called phosphorus boxes, containing a few matches, at first as high as 15s. each box. They were small sticks of wood dipped first in sulphur, and then in a composition of chlorate of potash, flowers of sulphur, colophony, gum or sugar and cinnabar for coloring. Accompanying them in the box was a vial containing sulphuric acid, into which the match being dipped, it was instantly ignited by the chemical action induced between the acid and chlorate of potash. The other ingredients were added merely on account of their combustible qualities. To this succeeded, in 1829, the use of the lucifer match, invented by Mr. John Walker, chemist, at Stockton-upon-Tees. In his experiments upon chlorate of potash, he found that this could be instantly ignited by friction, as in drawing a stick coated with it quickly through folded sand-paper. The salt was made to adhere to wood already coated with sulphur, by dipping this in an emulsion prepared with mucilage, of either phosphorus or sulphuret of antimony and chlorate of potash. The other inflammable ingredients served to retain the fire and communicate it to the wood. Mr. Walker manufactured but few of these matches for use in his neighborhood. Professor Faraday, learning of them, procured some, and brought them into public notice. Their useful properties were soon perceived, and their manufacture rapidly increased, till it became an important branch of industry in Europe and the United States, furnishing employment to large numbers of men, women and children. The chief objection to the preparation was the noise produced in igniting the match. This was afterward obviated by the substitution of niter or saltpeter for the chlorate of potash, and the disagreeable smell of the burning sulphur was diminished by replacing a part of this substance with stearine. The best wood for matches is clear white pine, which possesses the softness required for the manufacturing process, together with the necessary stiffness and inflammability; and the quantity of this consumed in their manufacture is enormous. The wood is first sawed into blocks of uniform size, and the length of two matches. By machines of ingenious construction, these are afterward slit without loss of material into splints, which being collected into bundles and tied are dipped into the composition, first one end and then the other. Another string is then fastened round them, after which they are cut across between the two strings by a circular saw which divides them in the middle. Round matches are formed by forcing the wood endwise through holes in plates, which in the English works are an inch thick, with steel face and bell-metal back. In American establishments tubes are employed whether for round or square splints. The perforations are made as near together as possible, only leaving enough of the metal between to give the necessary strength for cutting. This invention was patented in England in 1842. The acid fumes thrown off from the phosphorus in the various processes of making matches frequently cause among the people employed a terrible disease which attacks the teeth and jaws; and to such an alarming extent did it prevail in Germany, that the attention of the government was called to it. The dippers are most liable to suffer in this way, in consequence of standing for hours over the heated slab upon which the phosphorus is spread. As those persons with decayed teeth are most susceptible of the disease, they are carefully excluded from some manufactories. No antidote has as yet been discovered to this terrible disease. Its natural course is to rot the entire jaw bone away. This generally occupies several years with a steady discharge of matter outside and into the mouth. The pain is not very acute, but is constant, and the sufferer seldom survives the natural course of this disease. Many operations have been performed, chiefly by Dr. Mott at the New York Hospital. In some cases the entire jaw bone, and in others only one half or one side of the jaw has been removed. By this process the disease is arrested, and the patients generally recover. Thorough ventilation and careful attention to cleanliness have been found the most effectual preventives. It is a fact worthy of notice that, insignificant as matches are, it is a matter of importance, on account of the immense numbers made, that the manufactories should be situated in districts where timber is cheap. One manufacturer in Herkimer county, N. Y., is said to have consumed within the last 18 years 2,225,000 feet of lumber, producing 6,500,000,000 matches. Probably the largest manufacturer in the United States is Mr. Charles Partridge, of New York. His works, for the sake of abundant supplies of material, are in the wooded district of Lewis county, N. Y., near the Black River canal. Beside the wood employed for the splints, large quantities are also consumed for the small cylindrical boxes in which the matches are transported. Some of the splints are exported to the West Indies and South America, where the manufacture of matches has been established within a few years past. The matches themselves are largely exported to the East Indies, Australia, China, Mexico, South America, the Pacific coast, &c. The total amount manufactured in the United States is estimated at 7,000 gross of boxes daily, containing 35,700,000 matches, and worth $3,000.

JOURNAL OF PATENT LAW.

A combination of new materials producing a useful result, or a new combination of old materials, producing a substantial benefit, is patentable. But a mere substitution, in an already known combination, of a material which, although known, yet has never before been used in the identical combination, for the material commonly used, is not the subject of a patent. What we mean is more fully illustrated in the case of Hotchkiss *vs.* Greenwood. The case was brought against the defendant for an alleged infringement of a patent for a new and useful improvement in making door knobs, &c., and was first tried at the Ohio Circuit, from which an appeal was taken to the U. S. Supreme Court.

The improvement consisted in making the knobs of clay or porcelain, and in fitting them for their application to doors, locks, and furniture, and various other uses to which they might be adapted; but more especially in this: that of having the cavity in the knob in which the screw or shank is inserted and by which it is fastened, largest at the bottom, and in the form of dovetail or wedge reversed, and a screw formed therein by pouring in metal in a fused state; and after referring to drawings of the article thus made, the patentees conclude as follows:—"What we claim as our invention, and desire to secure by Letters Patent, is the manufacture of knobs, as stated in the foregoing specification, of potter's clay or any kind of clay used in pottery, and shaped and finished by molding, turning, burning and glazing; and also by porcelain."

On the trial, evidence was given on the part of the plaintiffs, tending to prove the originality and usefulness of the invention; on the part of the defendants, tending to show the want of originality, and that the mode of fastening the shank to the knob, as claimed by the plaintiffs, had been known and used before, and had been used and applied to the fastening of the shanks to metallic knobs.

The Court charged the jury that if knobs of the same form and for the same purposes as that claimed by the patentees, made of metal or other material, had been before known and used; and if the spindle and shank, in the form used by them, had been before known and used and had been attached to the metallic knob by means of a cavity in the form of dovetail, and infusion of melted metal, the same as the mode claimed by the patentees, in their attachment of shank and spindle to their knob, and the knob of clay was simply the substitution of one material for another, the spindle and shank being the same as before in common use, and also the mode of connecting them by dovetail to the knob, the same as fore in common use, and no more ingenuity or skill required to construct the knob in this way than that possessed by an ordinary mechanic acquainted with the business, the patent was invalid and the plaintiffs were not entitled to a verdict.

This instruction, it was claimed, was erroneous, and one for which a new trial should be granted. But the Supreme Court sustained the ruling of the Circuit Court, and affirmed the judgment. The following is a portion of the opinion delivered upon the decision:—

Nelson, J.—The instruction assumes and, as was admitted upon the argument, properly assumes that knobs of metal, wood, &c., connected with a shank and spindle in the mode and by the means used by the patentees in their manufacture, had been before known and were in public use at the date of the patent; and hence the only novelty which could be claimed on their part was the adaptation of the old contrivance to knobs of potter's clay or porcelain; in other words, the novelty consisted in the substitution of the clay knob in the place of one made of metal or wood, as the case might be. And in order to appreciate still more clearly the extent of the novelty claimed, it is proper to add that this knob of potter's clay is not new, and therefore constitutes no part of the discovery. If it was, a very different question would arise, as it might very well be argued and successfully urged, that a knob of a new composition of matter to which this old contrivance had been applied, and which resulted in a new and useful article, was the proper subject of a patent. The novelty would consist in the new composition made practically useful for the purposes of life, by the means and contrivances mentioned. It would be a new manufacture, and none the less so within the meaning of the patent law, because the means employed to adapt the new composition to a useful purpose was old or well known.

But in the case before us, the knob is not new, nor the metallic shank and spindle, nor the dovetail form of the cavity in the knob, nor the means by which the metallic shank is securely fastened therein. All these were well known and in common use, and the only thing new is the substitution of a knob of a different material from that heretofore used, in connection with this arrangement.

Now it may very well be that, by connecting the clay or porcelain knob with the metallic shank in this well-known mode, an article is produced better and cheaper than in the case of the metallic or wood knob; but this does not result from any new mechanical device or contrivance, but from the fact that the material of which the knob is composed happens to be better adapted to the purpose for which it is made. The improvement consists in the superiority of the material, which is not new, over that previously employed in making the knob. But this, of itself, can never be the subject of a patent. No one will pretend that a machine, made in whole or in part of materials better adapted to the purpose for which the old one is constructed, and for that reason better and cheaper, can be distinguished from the old one or, in the sense of the patent law, can entitle the manufacturer to a patent. The difference is formal and destitute of ingenuity or invention. It may afford evidence of judgment and skill in the selection and adaptation of the materials in the manufacture of the instrument for the purposes intended, but nothing more.

Now, if the foregoing view of the improvement claimed in this patent be correct, it is quite apparent that there was no error in the submission of the questions presented at the trial to the jury, for unless more ingenuity and skill in applying the old method of fastening the shank and the knob were required in the application of it to the clay or porcelain knob than is possessed by an ordinary mechanic acquainted with the business, there was an absence of that degree of skill and ingenuity which constitutes essential elements of

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every invention. In other words, the improvement is the work of the skillful mechanic, not that of the inventor. We think, therefore, that the judgment is and must be affirmed.

ASHCROFT'S REPLY TO THE ENGINERES' ASSOCIATION.

MESSRS. EDITORS:—In your issue of this week, I find a report, by a committee of the American Engineers' Association, of your city, on my "Low Water Detector," which may leave an unfavorable impression upon the public mind if not noticed. The committee report:—"We examined this instrument at three different places: at the Astor House, where we learned from the engineer that, in his presence and that of our vice-president, the alarm had given warning with two cocks of solid water in the boiler; at the Bible House, where the same thing occurred; and at the Cooper Union, where we found that the metal had commenced to corrode after but little use. In view of these facts, your committee cannot recommend it."

Allow me, Messrs. Editors, to state what the low water indicator is and how it operates. This instrument is composed of eight feet of common gas pipe, of one inch diameter, having on its upper end a hollow cast iron globe of six inches diameter, and a small chamber beneath the globe to hold the disk or fusible alloy. The disk is one inch diameter and one-quarter of an inch thick, and is composed of bismuth, 5 parts; tin, 3 parts; and lead, 2 parts: its melting point is 212°. The detector, when attached to a boiler, has two feet of pipe inside and six outside; the pipe inside should be within two inches of the flues of the boiler. The operation is as follows: after the boiler has been filled to the water line, and put in action, the pressure of the steam forces the water up the pipe into the air chamber. After a lapse of ten hours, the water fills every part of the instrument. There being no circulation of water in the pipe so long as the lower end of the pipe is submerged, the disk will remain solid, as the water in the upper part of the instrument is comparatively cool, never rising above 140° (unless the space above the boiler is converted into an oven chamber); but when the water in the boiler falls to or below the end of the pipe, the water in the pipe falls out by its own gravitation, and the steam entering, at once melts the disk and sounds an alarm.

Since August 1, 1857, I have manufactured, sold and received payment for over one hundred thousand dollars worth of the above-described low water detector. At this present time, over three thousand of these instruments are in use, giving the highest satisfaction to engineers and owners. It would be difficult to tell how many lives and how much property these detectors have saved; but we know of hundreds of instances of their giving timely warning of low water.

The committee report against this instrument for two reasons: First, It gave an alarm at the Astor House boiler "with two cocks of solid water"—the same at the Bible House; second, "At Cooper Union, where we found the metal had commenced to corrode after but little use."

Let us examine this evidence, and see how it agrees with science and practical experience: First, A thousand instances exist where the disk has remained at a distance of six feet above the boiler—the distance of the one on the Astor House boiler—solid for one year. Why should it not be so? There being no circulation in the instrument unless the disk is not firmly screwed to its seat, the temperature cannot rise above 140°, and this heat will not affect the solidity of the disk; but if the disk is not screwed up tight, and is allowed to drip, then a circulation will commence, and as soon as the temperature of the water in the chamber reaches 212°, the disk must melt. A false alarm may be produced by two causes; one carelessness, the other ignorance. 1st. If the disk is not made tight to its seat, a circulation of water will melt it; 2d. Cutting the pipe too short, bringing it too near the boiler, the radiation of heat from which would fuse it. One of two things must be present in the instance at the Astor House, viz.; a leak in the instrument or a radiation of heat from the boiler, creating an oven-like heat above the boiler as great as 200°. Evidence can be produced to show that the alarm at the Astor House was given after a new plug had been placed in the instrument · the first one having remained in the detector months before it melted, and then low water was the cause; and since this time the instrument has not been in favor. If it had had "fair play," a new fire box to the boiler need not have been necessary to the safety of those who sleep above the boilers.

Second, The corrosion of the plug. Dr. Jackson, Massachusetts State Assayer, says:—"In reply to your question, whether or not your safety plug, consisting of tin, 3 parts; lead, 2 parts; and bismuth, 5 parts, is liable to be corroded by water when used as directed by you, I would say that the alloy is not liable to rapid oxydation from the action of water, and that only a thin film of oxyd will form on the surface of the plug, which will not impair its efficiency as a safety plug. It is a small matter to renew the plug from time to time, say once in four or six months."

In view of the facts here stated, I respectfully submit that justice to the low water detector would seem to require a re-consideration at the hands of the committee. E. H. ASHCROFT.

Boston, Mass., Dec. 7, 1860.

AMERICAN SHIPBUILDING FOR FOREIGN GOVERNMENTS.

The *Grand Admiral*, the flag ship of the Russian navy, was built in this city; another steamer was constructed here for the Pasha of Egypt; and there is now lying at pier No. 13, North river, a steamer which has just been constructed by Kirkman & Co., at Wilmington, Del., for the government of Ecuador, and of which the following is a technical description:—

STEAMSHIP "GENERAL FLORES."

Hull of Delaware oak; copper fastened and coppered; length on deck, 110 feet; breadth of beam, 20 do.; depth of hold, 8 do.; rig, topsail schooner. Engine—One vertical condensing engine, 24 inch cylinder and 28 inch stroke, with adjustable cut-off, capable of being moved at the will of the engineer between 6 and 18 inches while running. Screw—A true screw; 7 feet 6 inches diameter and 14 feet pitch. Boiler—One tubular boiler of the ordinary kind, with 26 feet of grate surface and 396 do. of heating surface, counting one-half the area of tubes. On her trial trip, with 30 lbs. steam and vacuum of 14 do., and cutting off at 9 inches, she made 80 turns of her wheel per minute and a speed of 11½ miles on still water.

She was built by order of Don Antonio Flores, the Minister from the Republic of Ecuador to the United States, and is intended for the service of the government. Messrs. Pusey, Jones & Co. of Wilmington, were the contractors and builders of her machinery.

THE LARGEST HOTEL IN THE WORLD.

The largest hotel in this country, or in the world, is said to be the Lindell House, now nearly completed, in St. Louis, Mo. It is 272 feet front; 227 feet deep; 112 feet high, and fronted with cream colored magnesian limestone. Its cost, unfurnished, will be $600,000. It has 500 rooms, and can receive 1,200 guests. The St. Louis *Democrat* says:—"The brick laid in its walls number 8,000,000, sufficient to pave an area of over 30 acres. This is in addition to 8,000 perches of rubble stone in the foundation, 35,000 cubic feet of cut stone in the fronts, and other stone—in all costing over $100,000. If a boarder desires to take a walk through the wide and lofty corridors before breakfast, he may travel one and a quarter miles without going over the same floor twice. Besides the marble flooring and other flagging, 300,000 feet of lumber have been used in its floors, and it will require 30,000 yards of carpet to cover them. Some 16,000 feet of gas pipe are required to light it, with many thousands of burners; 120,000 lbs. of lead and 30,000 lbs. of iron pipe to supply it with water, besides that for heating it. Forty or fifty miles of bell wire will be required, and three water tanks, containing 30,000 gallons or 50 tuns of water, will rest upon its roof, which water is pumped up with steam engines."

A TARGET formed of three cast-iron blocks, each 8 feet long, 2 feet high, and 2½ feet thick, each weighing 8 tuns, was smashed to pieces with ten 68-pound shot fired at a distance of 400 yards.

RED HOT GUNS.—There is no doubt whatever that cast-iron, long submerged in the sea, will, on being exposed to atmospheric air, become hot even unto redness and sometimes fall to pieces. Such was the case with some iron guns which formed part of the armament of one of the vessels of the Armada, sunk off the Island of Mull; and the cast-iron balls with which some of the guns of the *Mary Rose*, sunk off Spithead *temp.* Henry VIII., were loaded. Mr. Wilkinson, in his "Engines of War" remarks, p. 242:—"It is also an extremely curious fact that the cast-iron gratings which have been long immersed in the porter backs or vats of large London breweries possess the same property of becoming hot on exposure to the atmosphere when the porter is drawn off for the purpose of cleaning them."

A BOLD MECHANICAL PROJECT.—By the Bessemer process of making steel and wrought iron directly from the ore, the wrought iron is run in a melted state into molds, and thus forms are cast of this material. This has suggested the daring scheme of casting an iron ship, with its sides, beams, braces, &c., all in one piece! In case of a naval vessel to be protected by 4½-inch shot-proof plates, of course the mold would be made thick enough, and these would be cast as a part of the ship. When this magnificent idea is realized, we shall suggest placing the ship in a bath, in a close dock, and coppering or zincing her by the electroplate process.

THE TELEGRAPH INVENTOR AS AN ARTIST.—Long before Samuel Findlay Breese Morse began to dream of electro-telegraphy, he was an accomplished artist. How beautifully does Leslie allude to him in his interesting autobiography! Yes, Professor Morse was the pupil of West, and was the companion of Leslie, Irving, Allston, and others, in busy, plodding London. The City Hall (that building which came near "departing this life" at the celebration of the "completion" of the sub-marine telegraphic cable) contains one of the best portraits of Lafayette ever painted. This is from the easel of Professor Morse. His very title of "Professor" comes from the fact that he was the appointed Professor of Fine Arts at the foundation of the New York University.

CULTIVATING LIQUORICE IN TEXAS.—The San Antonia *Ledger* says that a Mr. Poinsard of that city, has been eminently successful in the culture and acclimation of liquorice root, which he had imported from France. Of all the plants imported, one alone survived. So luxuriant was its growth that it radiated, notwithstanding the drouth, covering the ground for a circumference of fifteen feet, proving that irrigation is not necessary to its successful growth. Indeed so successful has Mr. Poinsard been, both in relation to its acclimature and culture, that he looks forward to the liquorice root becoming speedily an article of extensive export from Western Texas.

THE STUDY OF SCIENCE.—Science is worthy of study by all men, because it is so intimately associated with all the pursuits of life. The whole animate and inanimate creation is embraced within its folds. It affords ample scope for the exercise of the most comprehensive and refined intellects, as well as those of humble and moderate pretensions. The mechanic and chemist, the poet and scholar, the manufacturer and merchant, can find, in the pursuit of science, a boundless source of pleasure and profit.

PROFESSOR MORSE has just received from the King of Portugal the Cross of Chevalier of the Order of the Tower and Sword, being the fifth title of that character which has been bestowed upon him by European Sovereigns for his invention of the telegraph.

COAL OIL IN THE ROCKY MOUNTAINS.—The *Rocky Mountains News* says that coal oils has been discovered in the mountains, about five miles from Canon City. The spring is supposed to be inexhaustible, and the oil is said to be fully as pure as that found in Pennyslvania.

THE largest cast iron building in the world is now being erected at Havana, Cuba, by James Bogardus, Esq., of New York. It is intended for a warehouse to store merchandize on the dock. In length, it is 800 feet; depth, 70 feet; hight, 50 feet.

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WHAT KNOWLEDGE IS MOST WORTH.

In Herbert Spencer's essays on education—a most profound work noticed by us a few weeks since—we find the following exquisite paragraph on the utility of practical science:—"A grounding in science is of great importance, both because it prepares for all this and because rational knowledge has an immense superiority over empirical knowledge. Moreover, not only is it that scientific culture is requisite for each, that he may understand the *how* and the *why* of the things and processes with which he is concerned as maker or distributor; but it is often of much moment that he should understand the how and the why of various other things and processes. In this age of joint stock undertakings, nearly every man above the laborer is interested as capitalist in some other occupation than his own; and, as thus interested, his profit or loss often depends on his knowledge of the science bearing on this other occupation. Here is a mine, in the sinking of which many shareholders ruined themselves from not knowing that a certain fossil belonged to the old red sandstone, below which no coal is found. Not many years ago, $20,000 was lost in the prosecution of a scheme for collecting the alcohol that distills from bread in baking: all of which would have been saved to the subscribers had they known that less than a hundredth part by weight of the flour is lost in fermentation. Numerous attempts have been made to construct electro-magnetic engines, in the hope of superseding steam; but had those who supplied the money understood the general law of the correlation and equivalence of forces, they might have had better balances at their bankers. Daily are men induced to aid in carrying out inventions which a mere tyro in science could show to be futile. Scarcely a locality but has its history of fortunes thrown away over some impossible project."

THE French photographers have succeeded in effecting an important amelioration in the art of obtaining *fac-similes* of old manuscripts; recent improvements in the photographic art enabling them to produce perfectly distinct and legible copies of the palest and most illegible manuscripts. On old parchments, the ink, under the influence of time, assumes a yellowish tint, which often becomes undistinguishable from that of the parchment, so that it cannot be read without the greatest difficulty. Now, during the photographic process the brilliant and polished parts of the parchment reflect light much better than those where the ink has been deposited. However colorless it may appear, the ink has not lost its anti-photogenic qualities, opposed to the photogenic ones of the parchment; and thanks to this opposition, black characters may be obtained on the sensitive surface, in return for much paler ones on the original. Photographers are also able to obtain, at pleasure, enlarged or diminished copies of manuscripts, pictures, statues, and other works of art. Many recent photographs, examined with the aid of a microscope, reveal particles invisible to the naked eye; several of the lunar impressions taken during the late eclipse, and some of the solar ones, are cited as belonging to this category.

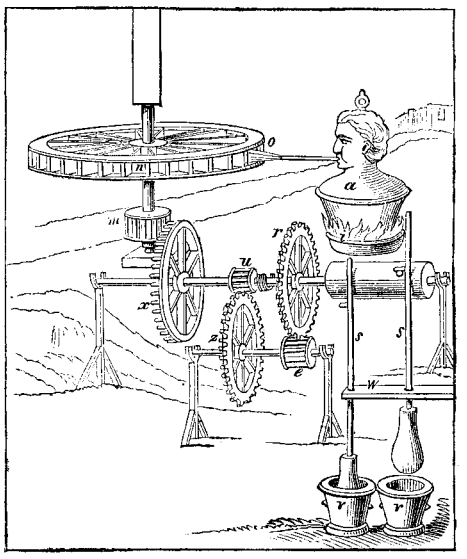
A RED DYE IN CHINESE SUGAR CANE.—The stalks of the Chinese *sorgho* contain a coloring matter possessing great tinctorial power. It is prepared by fermenting the stalks of the plant from which the juice has been expressed. At the expiration of fifteen days the coloring matter is developed, and it gives a beautiful brown or red color to the stalks. They are dried to stop the fermentation, and then ground to a fine powder, which is treated with water. This removes a small portion of the color. It is then treated with a weak solution of caustic soda or potassa. The base is neutralized by sulphuric acid, and the carmine is soon deposited under the form of light flakes. The red of the sorgho is soluble in alcohol, the alkalies and feeble acids. It answers very well for dyeing silk and wool, and it appears to resist the action of light.

A STEEL target, at Woolwich, weighing 30 tuns, placed on sleepers of wood, was driven back several feet on the ground by every 68-pound shot fired at a distance of 600 yards. This is a remarkable proof of the percussive power of shot.

ROMANCE OF THE STEAM ENGINE.

NUMBER III.

BRANCA.—The next steam inventor succeeding De Caus, the French engineer, was Branca, an Italian architect and engineer, who, in 1629, illustrated the first steam motor applied to drive machinery. It consisted of a horizontal steam wheel which operated a pair of stampers, as represented by Fig. 8. *a* is the *œlipile* have a fire under it, and the cover is surmounted with the figure of a human head, in the style of a spouting fountain. The steam issues from the mouth against the vanes of the wheel, *o*, causing it to revolve on its axis, *n*. A pinion, *m*, on the axis of the steam wheel takes into wheel, *x*, on the shaft of which is a roller having several lifters, which operate stampers, *s s*, for grinding substances in the mortars, *v v*. The other wheels, *u r z e*, simply show how motion and power may be transmitted from the secondary shaft. This mode of applying the steam to obtain power is inferior to that of Hero's, but it "shadowed forth" its subsequent great



destiny in driving machinery. Branca published a work on machinery, in which this figure is found. Another figure in his volume shows smoke rising from a blacksmith's hearth operating a wheel which communicates motion by gearing to rollers, for flattening iron bars. It was undoubtedly the first iron rolling mill that was illustrated, and it was ingeniously suggested that the economy of the whole operation was due to the use of smoke or hot air arising from the very fire which heated the iron, to drive the rollers. A hot air engine applied in this manner would certainly be more economical than a steam one. Branca was a man of fine tastes and possessed great ingenuity.

BISHOP WILKINS AND HIS FLYING MACHINE.—The next person worthy of notice as a steam inventor was John Wilkins, bishop of Chester, England, brother-in-law of Oliver Cromwell. He was one of the most remarkable men of his time, and was a rare combination of learning, fancy and shrewdness. He preached a discourse tending to prove that "it is probable there may be another habitable world in the moon." This produced considerable merriment among the wits of the day, and among others, the Duchess of Newcastle, who was a famous scheming character. She objected to the good bishop's doctrine, and said to him that "posterity might find out some conveyance to the other world, but the difficulty in the case would be the want of places for refreshments on the road." The bishop expressed himself surprised that such an objection should come from a lady who had been all her life "building castles in the air." Bishop Wilkins declared his belief that it was not impossible for man to fly. He said: "I do seriously, and upon good grounds, affirm that it is possible to make a flying chariot in which a man may sit and give such a motion unto it as shall convey him through the air; and this perhaps may be made large enough to carry divers men at the same time, together with food for their *viaticum*, and commodities for traffic. It is not the bigness of anything of this kind that can hinder its motion, if the motive faculty be answerable thereunto. This engine may be contrived on the same principle by which Archytas made a wooden dove, and Regio Montanus a wooden eagle." * * * "Might not a *high pressure* be applied with advantage to move wings as large as the *rucks* or the chariot. The engineer might probably find a corner that would do for a coal station, near some of the castles."

The good bishop thought this would be an inconceivably superior method of traveling, above any other conveyance in that day, and the man who would invent it would not only "make himself," but also the age in which he lived.

Bishop Wilkins certainly lived several centuries in advance of his age, in the way of speculation on mechanical subjects. He was the first writer who proposed steam as the motive agent for propelling chariots in the air. In our own day the same agency has been suggested several times, but we do not seem to be much nearer the consummation of such a desirable object, than when Oliver Cromwell—the bishop's great brother-in-law—held a firm grip on the destinies of England, two hundred years ago. If flying through the atmosphere could be rendered practical and safe by man, it would be the greatest of all inventions achieved by the genius of man over the elements of nature. The very idea of careering through the air in huge steam chariots, spurning with disdain our muddy streets, railroads and steamboats, is perfectly exhilarating.

John Wilkins, the Bishop of Chester, although a preacher of gospel sermons, did not hold himself so lordly spiritual as to overlook domestic and social improvements for the good of his race. He also proposed that the smoke jack (hot air and gas motor) should be applied to the "chiming of bells and other devices," and as a reason for so doing he said "there cannot be any more pleasant contrivance for continual and cheap music; and it may also be useful for the reeling of yarn, the rocking of a cradle, with divers like domestic avocations."

In our next article we shall present illustrations of the Marquis of Worcester's steam engines and give an account of the first applications of steam that were suggested for heating buildings.

IRON PLATED SHIPS.

The long series of experiments and discussions in England on this subject seem to have resulted in the adoption of the following conclusions:—

1st. A cannon ball will pass through almost any number of thicknesses of boiler plate which are merely riveted together.

2d. Wrought iron, 4½ inches thick, welded into solid plates, will resist any shell, and they will resist any solid shot striktng only once in the same place; but a succession of solid shots striking the same plate will break it in pieces, causing great destruction to the ship.

3d. Wooden ships plated with iron are terribly shattered by shot striking the plates, when the plates are not pierced by the ball.

As vessels plated with 4½-inch iron are very top heavy, it is necessary that they should have great breadth of beam or they will founder in a rough sea; and as, with breadth of beam, they must be very long in order to make them sharp enough for speed, it follows that none but large vessels are suitable for carrying iron armor.

In accordance with these conclusions, the British government is now building enormous iron ships for their navy, to be protected by 4½-inch iron plates. One of these—the *Warrior*—is nearly completed. She is larger than any vessel afloat, with the single exception of the *Great Eastern*, being 420 feet long and measuring 6,117 tuns British measurement. We shall publish a minute description of her in our next number.

STOPPING LEAKS IN STEAM PIPES.—In factories heated with steam, the iron pipes rust inside, and this, in the course of time, eats through the metal and forms leaks in several places. A correspondent writing to us from Sandersville, N.Y., informs us that he has effectually stopped a number of such leaks in a long pipe, by putting an iron clasp on each with a piece of vulcanized india-rubber under it. This saved the expense of getting a new pipe for a long time after the old one commenced to leak. We have found a piece of sheet lead, scraped bright on the inside, very effectual in stopping a leak in a steam pipe, when drawn tight by a screw clasp.

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TALK WITH THE BOYS.
No. 10.

Last week I described to you the process by which the food is prepared to nourish the system and poured into the blood. Now let us track it along and see how it is burned up to warm our bodies. The vein, into which the food is poured in the neck, leads directly to the right side of the heart; and as the heart is essentially a thick bag which is constantly expanding and contracting, as it expands, the blood from the great vein which has just received the food runs into the heart, and when the heart contracts, this blood is forced into the lungs. The lungs are what butchers call the lights, in sheep, hogs, &c., in which animals they are of substantially the same structure as in man. They are a grey, spongy mass, and, on close examination, are found to consist of an immense number of very fine blood vessels and air passages, which are separated from each other by an exceedingly thin membrane. As the blood is forced into all these blood vessels, the air vessels are filled at the same time by drawing in the breath, and thus the blood and the air lie side by side, separated only from actual contact by the very thin membrane of which I spoke. When the blood and the air are in this situation, there takes place a very curious operation, which has attracted a great deal of the attention of physiologists within the last few years. It is called osmose from the Greek, *osmos*. Do you know what that means, J?"

"No, sir."

"Do you know what *otheo* means?"

"Yes, sir, to push forward."

"*Osmos* is the noun, and means a pushing forward. The operation is this. When two fluids of opposite characters rest against each side of a thin animal membrane, they are found to mix together through the membrane, though the membrane might be entirely impervious to each when the other was away. It is by osmose that the blood is purified in the lungs. The waste carbonic acid and watery vapor pass through the membrane, and are thrown out into the atmosphere with the breath, as it leaves the lungs, and at the same time, oxygen from the air passes through the membrane and mixes with the blood. Now, let us get out the microscope and look at some blood."

"Where shall we get any blood?"

"Oh, we only want a very small drop, and I will prick my wrist and get a little."

"Here, father, take it out of my wrist. Give me a pin, Charles, and I will get some."

"There is a plenty, John; there is a plenty. Here, squeeze up the skin and let me touch this glass to it."

"Let me look, father."

"As soon as I get the focus right. Ah! here we have it, boys. Now, look. Don't shake the table."

"Why! What are all those little flat things?"

"Those are the blood corpuscles, and those that look like little square sticks are the same things seen edgeways, for they are shaped like coin, thickest at the edge, as you see. They are so small that the little drop which I took from John's wrist would contain about a million of them. These corpuscles absorb the oxygen which passes through the lung membrane, and they are borne by the blood as it returns from the lungs into the left side of the heart. As the heart contracts, the blood is forced through the arteries, which branch off, like the limbs of a tree, throughout every part of the system. The arteries, dividing down smaller and smaller finally terminate in exceedingly small pipes, called capillary vessels, which do not taper like the arteries, but are of uniform size, and mesh together in a manner somewhat similar to the webs of a net. These capillaries pervade every portion of the system, so that the point of a cambric needle cannot be thrust into any part of the body without puncturing some one of them and allowing the blood to escape. Through the thin membrane which forms the walls of the capillary vessels another operation of osmose takes place; a part of the oxygen which has been brought by the blood corpuscles from the lungs passes outward into the surrounding tissue, and carbonic acid and water pass inward into the capillary. Here, too, is the place where the burning takes place, by which the heat of the body is maintained. The oxygen, which has been brought by the blood corpuscles, combines with the waste carbon of the system, and with the carbon which has been brought by the food for that purpose, producing carbonic acid and generating heat, precisely as we saw it do in the burning gas which was the subject of our first conversation. Hydrogen is also burnt, generating heat and producing water, as in the burning of gas."

"If we should cut into the body could we see the fire burning?"

"No; it is such a slow fire that it does not produce light. It takes a heat of about 1,000° to give light, and this slow fire only heats the body to a temperature of 98°. The capillary vessels lead from the termination of the arteries to the beginning of the veins, and the blood passes on through them from the arteries into the veins, by which latter vessels it is returned to the heart. The blood in the arteries is of a bright scarlet color, but when it gives up, in the capillaries, the oxygen which it absorbed in the lungs, it changes to a deep purple color, which color it maintains in its passage through the veins to the heart, and from the heart to the lungs. In the lungs it again gives up its carbonic acid, which passes through the membrane of the lungs and is exhaled with the breath. And now, having again sent forth the atom of carbonic acid into the air, we will, for the present, bid it good bye. You remember how it is composed, one atom of oxygen united to two of carbon, like a beau sandwiched between two girls; away they float through the air, destined to a long and close union, unless they come in contact with a treacherous leaf, which, like the tongue of a scandalous gossip, will sow discord between them, and divide their firm union asunder. I propose that we begin next week, an inquiry into what the several articles on the breakfast table are composed of."

PRACTICAL DIRECTIONS TO ENGINEERS.

We continue our extracts from King's work on the Steam Engine, published by F. A. Brady, 24 Ann-st.

On Coming into Port.

After the engines are no longer needed, before hauling the fires, after a long run, it would be well to try the pistons and valves, in order to ascertain if they be leaky. To try the piston, open the water valve on one end of the cylinder and the steam valve on the opposite end; if the piston leaks, the steam will escape through the water valve. To ascertain if the steam valves leak, open the water valves on both ends of the cylinder. To ascertain if the exhaust valves leak, open the steam valves and any cock in the exhaust side of the steam chest or exhaust pipes.

While under way it may be discovered that there is a slight thump in the engine when passing one or the other or both centres, and the indicator having been applied shows the usual lead, the inference is that some part of the working engine is loose; it is important, therefore, to find out what it is on coming into port. To do this place the engine on the centre, and give the piston steam suddenly by raising and lowering the starting bar; observe closely the cross-head, crank-pin, main-shaft, and other main connections, to see where the jar is. Should it not be discovered after this, jam the cross-head fast, so as to prevent the slightest motion, and then give steam as before, in which event, if the thump be still felt, the piston will doubtless be found to have worked a little loose.

If it be the intention to remain in port several days, before hauling the fires, sufficient steam should be raised, if the boilers be capable of bearing the pressure, to blow all the water out of the boilers. After the boilers become cool, the hand-hole plates, over the furnaces particularly, should be taken off, to examine the crowns, where the greater amount of scale will be found deposited, and from which we can judge if the boilers require scaling. Mere dampness in boilers is found to be injurious, by occasioning a rapid oxidation, and in order to prevent this, one or two hand-hole plates should be taken off the bottom of the boilers, in order to let the water drain out dry. It would be well also to remove a man-hole plate from the top of the boilers to allow a circulation of air. If these things cannot be done it will be better to keep the boilers filled with water, rather than a small quantity in the bottoms. In damp climates such as the Isthmus of Panama, light fires should be made in the ash-pits occasionally.

Scaling Boilers.

Notwithstanding the water in the boilers is not allowed to exceed in density 1¾ to 2 per saline hydrometer, it will be found after a time that a quantity of scale, composed principally of lime, has accumulated on the crown sheets, tubes or flues, and other parts of the boiler. If this be allowed to remain the metal will become overheated and burned; it becomes necessary, therefore, to remove it, which can be alone done by mechanical means. Sharp-faced "scaling hammers" can be used to knock the scale off these places that are within the arm's reach, and long bars flattened at both ends, and sharpened, called "scaling bars," will knock it off the more remote parts. In the Martin tubular boiler, which is accessible in every part, it is only necessary to condense the steam in the boilers for a day or so after the ship comes to anchor; this will soften the scale so that a gang of men may be put into them as soon as the man-hole plates are removed, and scrape off all of it in a few hours. The scale, however, must never be allowed to exceed the thickness of writing paper.

It has been proposed in some quarters to heat the tubes or flues by burning shavings, or some other such substances in them, and then to cool them off suddenly by pumping cold water upon them, the sudden contraction causing the scale to crack off. The plan, however, to our mind, does not deserve much favor, and never should be resorted to, if the scale can be reached in any other manner, for the production of leaks will mostly always be the result!

It is, however, hoped that engineers will soon be relieved from this duty, and steamer owners benefited by the introduction of fresh water condensers into all sea steamers.

Preparatory to coming to Anchor, or securing to the Wharf.

Fifteen or twenty minutes before coming to anchor, or making fast to the wharf, the chief engineer should be informed of the fact by the officer of the deck, or some other person informed on the matter, so that the fires can be allowed to burn down, and the pressure of steam permitted to fall to such an extent that the necessity for blowing off is avoided. By this means the great nuisance of blowing off steam is not only obviated, but there is a considerable saving in fuel, the fires being permitted to burn down sufficiently low to supply only the amount of steam required while working the engines by hand, rendering it much easier also on the firemen (whose duties on any occasion are arduous enough) by having a very light instead of a very heavy fire to haul.

In coming to anchor it is usually well to pump a little extra water into the boiler, so as to insure a proper supply while operating the engines by hand.

When it is desired to raise steam, the order from the captain should always be what time it is intended to get underway, leaving to the discretion of the chief engineer to start the fires at such time as he may consider proper, in order to secure steam and every thing ready at the proper time.

FUSIBILITY OF METALS.

At the request of a correspondent we publish (from Tomlinson) the following table of the melting point of metals:—

Metals.	Fah.	Metals.	Fah.
Mercury	−29	Lead	612
Potassium	136	Zinc	772
Sodium	190	Silver	1873
Tin	442	Copper	1996
Cadmium	450	Gold	2016
Bismuth	497	Cast iron	2786

Arsenic volatilizes before it fuses, and antimony melts a little below redness. Professor Draper thinks he has shown that all substances become red at the same point—1,006° Fah.

A Triumph of Science.—The liquid of the blood is colorless, and its red appearance is due to the presence of innumerable little bodies floating in it, which are so small that three millions of them are contained in a drop which may be suspended on the point of a needle. These corpuscles are sacs filled with a compound substance, and it has been ascertained what both the film of the sac and its contents are composed of. Each one of these little bodies has its own life. They are formed, and grow, and die; and it is calculated that nearly 20 millions perish at every pulsation of the heart.

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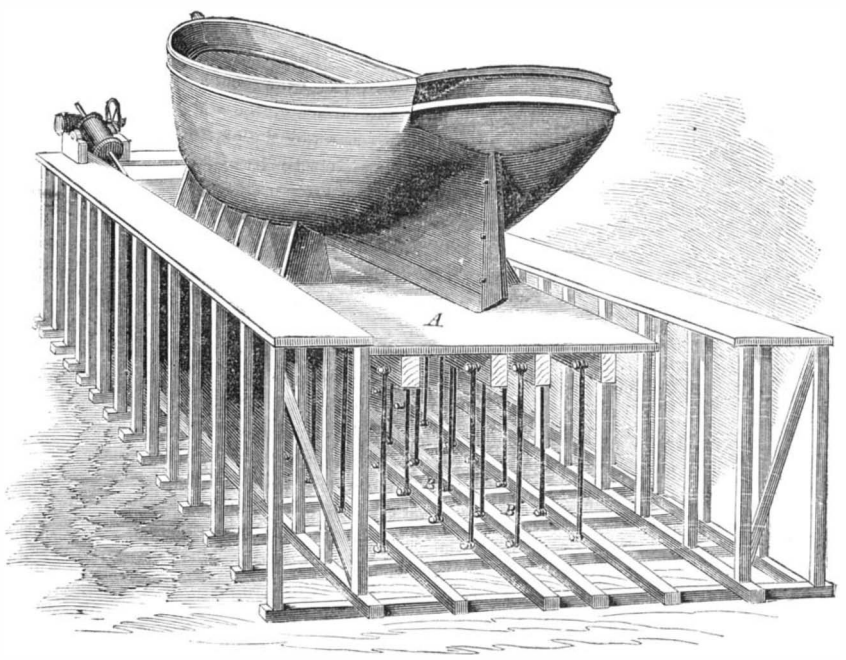
IMPROVED HYDRAULIC LIFTING DRY-DOCK.

The novel dry-dock here illustrated is the invention of an experienced builder of marine dry-docks and railways; and with his knowledge of this class of architecture he has endeavored to combine all possible good qualities, while avoiding the objectionable peculiarities of the various kinds now in use.

The platform, A, on which the vessel rests, is supported by the cast iron pillars, B B B, which have joints at the top and bottom, so that they may be turned down horizontally, thus gradually lowering the platform, A, to the bottom of the dock. When thus lowered, the vessel is secured upon it in the usual manner, and power is then applied to haul the platform forward, thus turning the pillars, B B B, up into a vertical position and raising the vessel into a position convenient for examination and repairs. The most suitable power for raising the platform is a hydraulic press worked by steam—the cylinder of the press of course to be hung upon trunnions. In lowering the vessel into the water, the movement is completely under the control of the operator, who can, with one hand, entirely arrest its speed or increase or diminish it at pleasure. The whole operation of raising and lowering is accomplished with the greatest ease, steadiness and precision. Among the advantages claimed for this dock are: Its cheapness of construction, its entire simplicity and consequent reliability, its economical operation, the uniform strain upon the vessel, and the superior facilities for working on the vessel when raised from the water for repairs.



CRANDALL'S HYDRAULIC LIFTING DRY-DOCK.

Patents have been taken out in England, France, and the United States, through the Scientific American Patent Agency. Further information in regard to the invention or orders for the construction of docks may be obtained by addressing the patentee, H. I. Crandall, or Messrs. Taber & Grinnell, New Bedford, Mass. The patent was issued on the 12th of June, 1860.

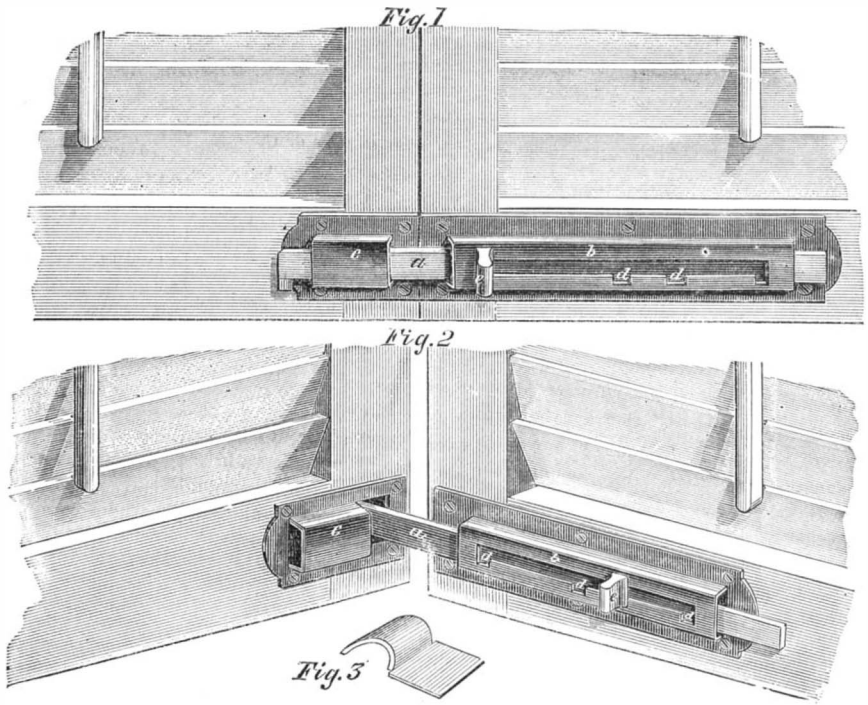
SCIENCE FOR FUTURE USE.

On this topic Mr. Spencer says: "And if already the loss from want of science is so frequent and so great, still greater and more frequent will it be to those who hereafter lack science. Just as fast as productive processes become more scientific, which competition will inevitably make them do, and just as fast as joint-stock undertakings spread, which they certainly will—so fast will scientific knowledge grow necessary to every one. * * * Had there been no teaching but such as is given in our public schools, England would be now what it was in the feudal times." These sentiments deserve to be written in letters of gold. At the present day knowledge increases so rapidly in every department, and is disseminated so generally by the periodical press, that the mechanic, the artizan, the manufacturer, and the dealer in stocks, who does not regularly read a paper devoted to science and the arts, soon becomes an ignorant man and labors under all the disadvantages of his ignorance. As an essential part of every public man's life, unless he is a subscriber to a scientific periodical, he certainly is justly liable to the charge of ignorance and the want of common sense, according to the teachings of Mr. Herbert Spencer, for that is the very spirit of his teachings.

PATENT LAWS of the United States, together with an epitome of the Patent Laws of foreign countries, is just issued and for sale at this office. It contains over 100 pages of useful information upon almost every question that relates to patents, and will be found of much service to all who are interested in such matters. Single copies by mail, 25 cents: at the counter, 20 cents. Inclose stamps or change, and address MUNN & Co., office of the SCIENTIFIC AMERICAN.

REEVE'S IMPROVED BOLT FOR WINDOW BLINDS AND SHUTTERS.

We invite the attention of all persons using window blinds or shutters to the improved bolt here illustrated, which is adapted to fasten the blinds securely in a closed position, or to hold them partly open, as may be desired.



REEVE'S IMPROVED WINDOW BOLT.

A long bolt, *a*, Figs. 1 and 2, is fitted to slide in a case, *b*, fastened to one of the blinds, and to enter the case, *c*, on the other blind of the pair. A button, *e*, is secured to the bolt with its shank passing through a slot in the case, and the case is made a little wider than the bolt, allowing the latter a little vertical play, so that the shank of the button, *e*, may fall into the notches, *d d d*, in the case, to hold the bolt in place, or may be lifted out of them when it is desired to slide the bolt along. The blinds are fastened in a closed position by sliding the bolt forward with its end entirely through the case, *c*, as shown in Fig. 1. For holding the shutters open, as shown in Fig. 2, a slot is cut through the case, *c*, for the end of the bolt to enter, where it is held in place by the lip or hook projecting downward upon its end, the shank of the button, *e*, falling into one of the notches, *d*, to prevent the bolt from slipping in the case, *a*. The end of the bolt is prevented from wearing the wood of the blind where it passes through the slot in the case, *c*, by the curved plate, *f*, Fig. 3, which is fitted into the wood behind the plate, *c*.

This shutter bolt is as simple in its construction as it is positive, reliable and convenient in its operation, and we predict its introduction into very general use.

Patents for this invention have been procured, through the Scientific American Patent Agency, both in this country and Great Britain, the American patent bearing date Sept. 18, 1860, and further information in relation to it may be obtained by addressing the inventor, Augustus Reeve, at Allowaystown, N. J.

CHIMNEY PATENT CASE.—Judge Leavitt has furnished the Cincinnati *Gazette* with his late decision in the suit of C. Dodge and J. B. Ryan against T. F. Caird, for an infringement of their patents granted on the 18th of March, 1856, for an improvement in chimney flues. This improvement consists of the combination of a flat iron plate placed horizontally above the grate closing the throat of a chimney, with the exception of a narrow opening in front, for the escape of smoke, in connection with a small recess below the plate. The utility claimed for the invention is that the unconsumed gas from the fire strikes against the plate in the chimney throat and is deflected into the recess below, where it is burned. The defendant denied that he had infringed this patent. He also had obtained a patent in April last for an iron plate placed in an arched position in the chimney, which plate was capable of being adjusted to suit the size of any flue, without alteration. This arrangement prevented, to some extent, the heat from escaping up the chimney without being utilized. This was the invention which he was using, and the Judge decided that it was different from the plaintiffs' patent, and refused to grant the injunction.

STEAM FIRE ENGINES.—The recent accident to the Croton pipes brought most of the members of our Board of Aldermen to the conclusion that it is best to provide every fire company in the city with a steam fire engine; so this great reform seems about to be introduced by the strength of its own inherent merits.

BINDING.—We are prepared to bind the volume just closing, or any of the previous volumes, in handsome muslin covers, with illuminated sides, and to furnish covers for other binders. Price for binding, 50 cents. Price for covers by mail, 50 cents; by express or delivered at the office, 40 cents.

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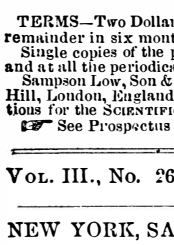
NEW YORK, SATURDAY, DECEMBER 22, 1860.

Good Things in Prospect—Improved Appearance of the "Scientific American"—New Type—Importance of Renewing Subscriptions Early.

A new volume of this paper commences with the next number. It is our intention to bring to our aid every possible facility to render the new volume more and more interesting and valuable to our readers, and we feel confident that none of them will have occasion to regret that they renewed their subscriptions. We believe also that no better investment of money can possibly be made than to take the SCIENTIFIC AMERICAN. The first step we shall take, by way of improvement, will be a new dress for the paper. Messrs. Conner & Sons, the well known type-founders, of this city, are casting for us a new font of type, from the new metal noticed by us a few weeks ago, and we hope to make our appearance next week in a new typographical costume. This involves a large outlay of money, but we cheerfully make it to benefit the paper and please its readers. It is important that all who wish to have the paper continued should renew their subscriptions promptly as future editions will not be electrotyped, and therefore, when the numbers of one issue are exhausted, it will be impossible for us to furnish complete sets. The reader who desires the paper will appreciate the importance of subscribing early, so as to be sure of all the numbers. According to our long established rule, all subscriptions that expire with this number will be discontinued.

AN EYE BACKWARD.



PROGRESS has ever been our watchword and reply. The past year has been prolific with exciting public events. The *Great Eastern* has visited our shores; ambassadors from distant Japan have paraded our streets, and the prince of Old England has been our guest. The fields of our husbandmen have yielded abundant harvests; our manufacturers have enjoyed a season of unequaled success; and every branch of national industry has advanced and prospered. Yet amid all these causes for rejoicing, the political horizon is overclouded, and ominous sounds of discontent come floating upon every gale. We fondly hope that the darkness may soon pass away, and the sunshine of united fraternal regard beam once more into the national heart.

Science has marched onward with steady tread during the year that has just closed. We cannot point to any great invention which stands out as the center of a class, like the electric telegraph or the sewing machine, but three thousand eight hundred and ninety-six American patents have been granted for useful improvements, and the number of patents issued in any country is a most reliable test of its material progress. It is to the inventive genius of man that we owe everything above the brutes. The talent of invention, however, requires to be put out to usury or it will rust in the casket, hence the wisdom of encouraging inventors and protecting inventions by a good system of patent laws. Every wise statesman is aware of this fact, therefore the greater the number of patents which are issued, the greater cause have the people for congratulation on the progress and advancement of the commonwealth.

In recent years, improvements have advanced with electric speed in comparison with former times. For this we are greatly indebted to the public press. The great inventions which have revolutionized social life, the modes of travel, and manufacturing operations, have been practically perfected during the present century. The germs of these existed of old, but for want of the press to disseminate knowledge, each succeeding age saw inventors commencing just where their predecessors commenced—at the foot of the ladder—not where they had ended, as is now the case. Every invention is now made the "stepping stone" to a subsequent improvement; this is the reason why we progress so rapidly in the present age. Time and labor are economized, and the fair fabric of science rises steadily every succeeding year.

The two volumes of the SCIENTIFIC AMERICAN which have been issued during the past twelve months furnish abundant evidence of the activity of inventors and the advancenent of science and art. We cannot here enumerate all the excellent improvements which have been illustrated and described; the whole circle of science has been represented, and a pictorial history of the arts for the year has been furnished. Several steam fire-engines and fire-escapes have been illustrated; the prize turbine wheel of the Philadelphia experiments; a most ingenious gyrascope governor: diagrams and instructions for building iron works have been given; cultivators, plows, telegraphs and steam engines have been presented; in short, all classes of mechanism, from the humble washing machine to the majestic steamship, have received attention.

The scientific press has also been a Pharos for throwing light upon disputed questions of science, and for pointing the way to improve and progress. The water gas light has been examined and exposed; and public attention has been re-directed to the importance of improving our iron manufactures by the Bessemer process. Although it is only three weeks since the latter service has been done through our columns, a gentleman has since called upon us to inquire where he could obtain a license for its use, as he had tested the invention and found it of great value in treating American iron. Thus it is that errors in science are pointed out and new improvements introduced to the public. Standing on the altitude of science and art, to which we have attained during the past year, we are enabled to ascend still higher during the year upon which we are about to enter.

SAFETY CLOTHING.

Personal safety from burning is a question of serious import at all times, but more so at this particular season of the year. During the cold weather, when grates or other heating apparatuses are used in almost every house, and when artificial light is more extensively required for illumination, a greater number of accidents occur from clothes taking fire than in any other equal period of the year. This we may always expect, because the dangers are more numerous; but to the common causes of deaths from burnings, the sad list of victims has been greatly extended by the fashions in dress which have become prevalent among women. Ladies' dresses are now so extended in their proportions, and being oftentimes of the most inflammable materials, it is no wonder that we frequently read of families being thrown into the deepest grief by some of their most amiable members having perished from their dresses becoming their funeral pyres. Such casualties shock the feelings more than any others, because we all know that the pains arising from burning are of the most excruciating character.

So frequent have such accidents become during the past two years, that some of the highest efforts of science have been brought into requisition for their prevention. The moral argument against the causes of exposure by unsuitable dresses has been ineffectual; fashion holds its sway in spite of all remonstrances and so many terrible lessons, and all that science can do in the case is to guide it to the most humane and safe results. This has been achieved by chemistry in the preparation of chemicals to be combined with the combustible fabrics of which dresses are made, whereby they are rendered nearly uninflammable. In Great Britain, these chemicals are now used in several large bleachworks, where they are combined with the pieces or goods in the finishing operations. They are also employed very extensively in large laundries and households, and they commend themselves to public attention everywhere. The best substances recommended for common use in rendering textile fabrics non-inflammable, are tungstate of soda and the sulphate of ammonia, which are now manufactured on a large scale for such purposes by a company in London, which has obtained two patents for the processes. In a late number of the *Chemical News*, Messrs. Briggs & Co. describe the mode of using these salts to the best advantage. Articles requiring to be ironed, after being washed, starched and allowed to dry in the open air, are soaked in a solution of the tungstate, then rolled in a sheet of dry linen, and ironed afterward in the ordinary way. The tungstate may be mixed with the starch, but this is not such a good method as the other. Articles which do not require to be ironed are treated with a solution of the sulphate of ammonia in the same manner as the tungstate of soda. Muslin so prepared does not present any peculiar appearance, and when exposed to fire it does not suddenly burst into flame; it merely singes away until it crumbles into ashes. Woolen and silk fabrics are not sufficiently inflammable to be dangerous, but all linen and cotton clothing, curtains for windows, sheets, and various other articles, would be rendered more safe by such treatment, without injury to their texture or color. The treatment of children's clothes by these substances is especially solicited, because so many accidents from burning take place to the "little ones at home."

We would not wish to be understood as asserting that the two substances described are the only sure ones for rendering such fabrics uninflammable, as there are several other articles which possess this property; but, according to F. Versmann and A. Oppenheim, London chemists, who have made a host of experiments with various chemicals, the tungstate of soda and the sulphate of ammonia give the best results. The stannate of soda appears to be equally as good a non-inflammable agent, but it is liable to impart a yellow tinge to white muslins; still, for children's cotton dresses, we can recommend its very general use. About one part of these salts dissolved in ten parts of water is about the proper strength to employ, and one gallon of this is sufficient for impregnating seven or eight ladies' muslin dresses. Being very easy of application, all families should avail themselves of these substances for rendering life more safe from the dangers of fire.

We use, in our nursery, a brass wire grating, somewhat in the form of a blower, to hang in front of the grate. This is compact, convenient and effectual; it not only protects the dresses of the children and nurse from contact with the fire, but it is quite a safeguard to the carpet from coals rolling out of the grate.

THE PAST.

The last year of this decade is drawing to a close. At this ending of the season, the mind naturally turns back to a review of the past; and, in turning back, the student of science is drawn to contemplate the long periods which geology and astronomy have revealed to our knowledge. The thought flits over the time of man's history, as forming but a step to the vast vista which stretches beyond. Reading the record of the rocks, we find that, before the human race made its appearance in the universe, our globe was inhabited by mammoths, megatheriums, mylodons, mastodons, and other huge quadrupeds, far larger than any that now roam upon its surface. For thousands of years these animals multiplied, lived and died, till at last, in the fullness of their time, they became extinct. If we follow back the course of geological history, to the first coming of the mammalia, we find the earth swarming with lizards and other lower forms of animated being. Beyond the lizards again there was an immense period in which the sea was filled with fishes, but during which there was no animal upon the land. Long before the higher orders of fishes were created there were hosts of the lower forms of marine life, star fishes, trilobites and polypi, existing in such immense numbers and through such periods that strata of the older rocks, of unmeasured

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thickness, are almost wholly composed of their remains. And this is as far as our positive knowledge extends; for whether, at the time of the formation of the oldest plutonic rocks, there were animals whose remains have been since entirely destroyed, we have no means of determining. There are, however, indications which have led to the general belief, that there was a time when the earth was whirling upon its axis, and sweeping in its long journey around the sun, through year after year, and century after century, without a living thing upon its surface. It is probable that the earth was then so hot that the matter now constituting the waters was all diffused in vapor, forming a cloud so deep and dense that no ray of sun or star could pierce through it. "And the earth was without form, and void and darkness was upon the face of the deep."

Where the positive facts of geological science fade away into dim conjecture, we enter upon the still more sublime revelations of astronomy. The observations of the nebulæ by Sir William Herschel and his successors render it probable that the matter of the solar system did once exist in minute self-luminous particles, like a vast firey cloud, which was sailing swiftly along in its immense orbit, while its matter was being slowly condensed into the globes which we call the sun and his attendant planets.

And here, at last, in its backward journey through the abyss of the past, the mind loses all guidance of reason or observation. In what condition matter existed before the formation of the nebulæ, we have no grounds even for conjecturing. We only know that duration must have been; for, it is a self-evident truth, that time could have had no beginning, as it can have no end.

IS A PATENTEE ENTITLED TO A COPY OF THE PATENT OFFICE REPORTS?

A correspondent makes the above pertinent inquiry. We can only answer that the patentees are the most entitled to the Patent Office Reports of any class of our citizens, and a few years ago they were the first to be supplied from the press of the public printer. But, alas! the order of supplying these valuable Reports seems to have been reversed, and it would even seem, from the vast number of letters similar in tone to the inquiry at the head of this article, that many of the patentees are neglected entirely in this respect.

The Patent Office is about the only self-supporting department under our government. The inventors pay into the Treasury every year several thousand dollars more than it costs to pay the expenses of the Patent Office; and notwithstanding Congress orders to be printed every year a great many thousand copies of the mechanical reports (13,500 of which were especially appropriated for Patent Office purposes, in the year 1859), yet there seems to have been such a scarcity that the patentees of last year have not been able to procure a copy.

This should not be the case: no class of people prize them as the inventors and patentees; none are so much entitled to them; and we hope Congress will not only order enough to be furnished to the Patent Office to supply every patentee and assignee of a patent with a copy for the year 1860, but that it will also instruct the Commissioner to see that they are distributed according to the intention of the statute.

The Patent Office should have the distribution of at least twenty thousand copies per annum. The Commissioner has in his department the names of persons most likely to be benefited by them, and should have the majority of the annual supply to distribute, instead of the members of the House and Senate being surfeited with so many copies as hardly to know what to do with them.

ASHCROFT'S LOW WATER DETECTOR.—On another page, we publish a letter from Mr. Ashcroft, in defence of his "Low Water Detector," in answer to statements on this subject contained in our report of the proceedings of the American Engineers' Association, published in No. 24. In support of his assertions, Mr. Ashcroft has shown to us a great number of certificates from parties who have had his detector in use for several years. These certificates will be found in the advertising columns of our next issue.

RESIGNATION OF COMMISSIONER THOMAS.

The Patent Office seems of late to have become the grand stepping stone to higher civil functions. Twice within the brief space of less than two years, the President's cabinet has been re-inforced by the selection of the Commissioner of Patents to a seat in the executive councils.

Mr. Holt succeeded the late Governor Brown as Postmaster General, and now we have the pleasure to record the fact of the appointment of Commisioner Thomas to succeed Mr. Cobb in the important office of Secretary of the Treasury.

This makes another change in the head of the Patent Office. In the meantime, however, its duties will be acceptably performed by S. T. Shugert, Esq., the present Chief Clerk. There are good reasons for hoping that, under existing circumstances, the President will make no appointment to the office of an inexperienced man. He might properly confer it either upon Mr. Shugert or upon ex-Commissioners Mason or Bishop. The appointment of either of these gentlemen would be satisfactory to all who have business with the Patent Office.

APPLETON'S CYCLOPAEDIA.

We have received from the publishers, D. Appleton & Co., Nos. 443 and 445 Broadway, this city, Vol. XI. of the "New American Cyclopaedia," carrying the alphabet from MAC to MOX, inclusive. Having given fully our very high opinion of this great work, it is unnecessary to repeat it here. It is a complete gazetteer, containing a description of all the countries, cities, rivers, towns, counties and places of any importance on the globe; and it is also a complete cyclopaedia of biography, containing sketches of the lives of all persons of note, living or dead. The eleventh volume contains more than 1,500 articles; and some idea of the variety of the subjects treated of may be obtained from the following list, which we extract from the table of contents:—Maclaurin, Madder, Madler, Maelstrom, Magic, Magic Lantern, Magnetism, Magneto-electricity, Mahogany, Maize, Manganese, Manometer, Marcy, Marl, Marriage, Marriage Settlements, Mary Magdalen, Mass, Match, Meal Worm, Measles, Mechanics, Mensuration, Mercury, Mercy, Sisters of; Metal, Metalloid, Meteor, Mica, Microscope, Milk, Milk, Sugar of; Millenium, Mint, Missions, Foreign; Missions, Protestant; Mohammed, Monkey, Monmouth, Battle of; Moth. As a specimen of the articles, we publish, on another page, the one upon "Friction Matches."

HUSSEY'S MOWER PATENTS.—Eunice B. Hussey, of Baltimore, Md., administratrix of Obed Hussey, deceased, has petitioned for the extension of four patents for reaping machines. These were originally one patent, which was granted to Mr. Hussey on the 7th of August, 1847; it was surrendered, divided and reissued in three patents, numbered 449, 450 and 451 on the 14th of April, 1851; after which No. 450 was surrendered, and divided into two patents. Their original term will expire on the 7th of August next. The testimony in this case will be closed on the 13th of February next; and the petition will be heard at the Patent Office on the 28th following, at 12 M.

STEAM EXPERIMENTS.—Information has been received by us that the experiments now being conducted at Erie, Pa., under the charge of a board of Naval Engineers, have thus far resulted in proving that no gain is derived from working steam expansively in engines. In our next issue, we shall publish a very accurate report of the experiments. The information will be of great importance to every engineer and manufacturer, and will serve to open their eyes to a state of facts which may somewhat surprise them.

OUR LARGE MACHINE SHOPS.—The Novelty Iron Works and the Morgan Iron Works are both working at present on short time, viz., nine hours, as we are given to understand, by reason of the financial embarrassment now obtaining in commercial circles, and not from any lack of work. Notwithstanding the hue and cry of politicians there are comparatively but few idle persons, and the first wave of the revolution with which we are threatened has not yet come in upon our works.

RECENT AMERICAN INVENTIONS.

The following inventions are among the most useful improvements lately patented:—

COTTON CLEANER.

This invention (by Benjamin Jackman, of Louisville, Ky.) relates to a machine designed to be attached to or connected with the flue of a cotton gin for the purpose of cleansing the cotton, or separating the dirt from it and condensing it, so as to facilitate the baling operation. The invention not only facilitates the baling, but also causes the bales to be more uniform and compact than by the usual baling process; and also obviates the use of a "lint room" to receive the ginned cotton, and in which lint room one or more hands are generally employed, to their great, and often fatal, injury, caused by the inhaling of the dust and fine particles of cotton with which the air within the lint-room is filled. The invention consists in the use of revolving screens, in connection with a dust chamber, and with standing screen and condensing rollers, so as to effect the desired end.

TEMPLES.

This invention relates to that kind of temple known as the "spur plate temple." It consists in inserting the teeth of a temple into a piece of wood, which is fitted to the plate of the temple in such a manner as to be removable for the purpose of being renewed with a new set of teeth when the teeth are worn out, or for the purpose of renewing the teeth singly when injured.

A STEAMER RUNS ACROSS THE ATLANTIC BY ITS OWN INERTIA.

While a steamer is getting underway, the power of the engine is exerted, partly to overcome the inertia of the ship and partly to overcome the resistance of the water and air; but when the full speed is realized, the resistance from the inertia of the ship ceases, and the whole power of the engine is thenceforth exerted to overcome the resistance of the air and water—the vessel running by her own inertia.

This principle is thus stated by W. James Gravesande, in his great work entitled "The Mathematical Elements of Natural Philosophy," a translation of which, from the original Latin, was published in England in 1747:—"A Ship drawn by a Rope Suffers Resistance from the Water: as long as this is less than that Pressure by which the Rope is drawn, the Celerity of the Ship is increased, and the Reaction, which is equal to the Action, as the Rope is equally stretched both Ways, is to be attributed in part to the Inertia of the Ship. When, the Celerity being increased, the Resistance of the Water has increased so much as alone to destroy the Action, whereby the Ship is drawn, it proceeds by its innate Force, with an equable Motion; two Pressures acting upon it, which mutually destroy one another; as I observed before of the Carriage."

WHAT IS WEALTH, AND WHERE DOES IT COME FROM?

With the beginning of the next volume, we shall commence the publication of a series of short articles on the "Production, Distribution and Consumption of Wealth." They will be written by a thorough political economist, expressly for the SCIENTIFIC AMERICAN, in a plain, common-sense style, and will not only point out the nature and origin of wealth, and the natural forces which determine the rate of wages and of interest, but will also explain the operations of banking, exchange and currency, all in a clear and intelligible manner, with illustrations drawn from the actual business transactions of this community.

THREE CROPS OF GRAPES IN ONE SEASON.—We have seen a bunch of grapes taken from the vine of Mr. John W. Alexander, of Green Point, which were part of a third crop from the same vine in one season. The berries were full and plump and all well formed, without blemish or fault. Mr. Alexander claims to have a new method of culture, by which he can produce this extraordinary result every year.

A CUBIC inch of beechwood charcoal must have, at the lowest computation, a surface, in its pores, of at least 100 square feet.

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THE RISE AND PROGRESS OF INVENTIONS

During the period of Fourteen Years which has elapsed since the business of procuring patents for inventors was commenced by MUNN & Co., in connection with the publication of this paper, the number of applications for patents in this country and abroad has yearly increased until the number of patents issued at the United States Patent Office last year (1859) amounted to 4,538; while the number granted in the year 1845—fourteen years ago—numbered 502—only about one-third as many as were granted to our own clients last year; there being patented, through the Scientific American Patent Agency, 1,440 during the year 1859. The increasing activity among inventors has largely augmented the number of agencies for transacting such business.

In this profession, the publishers of this paper have become identified with the universal brotherhood of Inventors and Patentees at home and abroad, at the North and the South; and with the increased activity of these men of genius we have kept apace up to this time, when we find ourselves transacting a larger business in this profession than any other firm in the world.

We may safely assert that no concern has the combined talent and facilities that we possess for preparing carefully and correctly applications for patents, and attending to all business pertaining thereto.

FREE EXAMINATION OF INVENTIONS.

Persons having conceived an idea which they think may be patentable are advised to make a sketch or model of their invention, and submit to us, with a full description, for advice. The points of novelty are carefully examined, and a reply written corresponding with the facts, free of charge. Address MUNN & CO., No. 37 Park-row, New York.

PRELIMINARY EXAMINATIONS AT THE PATENT OFFICE.

The advice we render gratuitously upon examining an invention does not extend to a search at the Patent Office, to see if a like invention has been presented there, but is an opinion based upon what knowledge we may acquire of a similar invention from our long experience, and the records in our Home Office. But for a fee of $5, accompanied with a model or drawing and description, we have a special search made at the United States Patent Office, and a report setting forth the prospects of obtaining a patent, &c., made up and mailed to the inventor, with a pamphlet, giving instructions for further proceedings. These preliminary examinations are made through our Branch Office, corner of F and Seventh streets, Washington, by experienced and competent persons. Over 1,500 of these examinations were made lastyear through this office, and as a measure of prudence and economy, we usually advise inventors to have a preliminary examination made. Address MUNN & CO., No. 37 Park-row, New York.

CAVEATS.

Persons desiring to file a caveat can have the papers prepared on reasonable terms, by sending a sketch and description of the invention. The government fee for a caveat is $20. A pamphlet of advice regarding applications for patents and caveats furnished gratis on application by mail. Address MUNN & CO., No. 37 Park-row, New York.

HOW TO MAKE AN APPLICATION FOR A PATENT.

Every applicant for a patent must furnish a model of his invention, if susceptible of one; or if the invention is a chemical production, he must furnish samples of the ingredients of which his composition is composed for the Patent Office. These should be securely packed, the inventor's name marked on them, and sent, with the government fee, by express. The express charges should be prepaid. Small models, from a distance, can often be sent cheaper by mail. The safest way to remit money is by draft on New York, payable to Munn & Co. Persons who live in remote parts of the country can usually purchase drafts from their merchants on their New York correspondents; but if not convenient to do so, there is but little risk in sending bank bills by mail, having the letter registered by the postmaster. Address MUNN & CO., No. 37 Park-row, New York.

Circulars of information concerning the proper course to be pursued in obtaining patents in foreign countries through our Agency the requirements of the different Patent Offices, &c., may be had gratis upon application at our principal office, No. 37 Park-row, New York, or either of our branch offices.

TESTIMONIALS.

The annexed letters, from the last three Commissioners of Patents, we commend to the perusal of all persons interested in obtaining Patents:—

Messrs. MUNN & Co.:—I take pleasure in stating that while I held the office of Commissioner of Patents, MORE THAN ONE-FOURTH OF ALL THE BUSINESS OF THE OFFICE CAME THROUGH YOUR HANDS. I have no doubt that the public confidence thus indicated has been fully deserved as I have always observed, in all your intercourse with the Office, a marked degree of promptness, skill and fidelity to the interests of your employers. Yours, very truly,

CHAS. MASON.

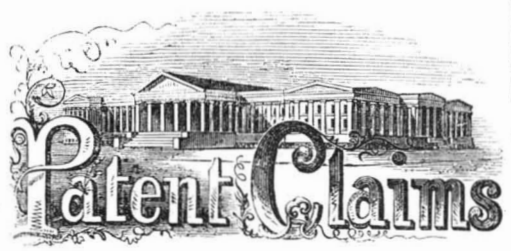
Immediately after the appointment of Mr. Holt to the office of Postmaster-General of the United States, he addressed to us the subjoined very gratifying testimonial:—

Messrs. MUNN & Co.:—It affords me much pleasure to bear testimony to the able and efficient manner in which you have discharged your duties of Solicitors of Patents while I had the honor of holding the office of Commissioner. Your business was very large, and you sustained (and, I doubt not, justly deserved) the reputation of energy, marked ability and uncompromising fidelity in performing your professional engagements. Very respectfully,

Your obedient servant, J. HOLT.

Messrs. MUNN & Co.:—Gentlemen: It gives me much pleasure to say that, during the time of my holding the office of Commissioner of Patents, a very large proportion of the business of inventors before the Patent Office was transacted through your agency, and that I have ever found you faithful and devoted to the interests of your clients, as well as eminently qualified to perform the duties of Patent Attorneys with skill and accuracy. Very respectfully,

Your obedient servant, WM. D. BISHOP.



ISSUED FROM THE UNITED STATES PATENT OFFICE
FOR THE WEEK ENDING DECEMBER 11, 1860.

[Reported Officially for the SCIENTIFIC AMERICAN.]

*** Pamphlets giving full particulars of the mode of applying for patents, size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

30,861.—S. W. Adams, of Moultrie county, Ill., for an Improvement in Corn Planters:

I claim the combination and arrangement, as described, of two plows, with the slide, L, seed boxes, B B, levers, C C, and D, shovel H, and knife, I, substantially as and for the purposes described.

30,862.—Wm. Apperly and C. P. Johnson, of Memphis, Tenn., for an Improvement in Cotton Harvesters:

We claim, first, The reciprocating plate, E, picker, d, and plate, F, when combined and arranged to operate as shown and described, to wit, the pickers, d, having a rotary and also a reciprocating and rising and falling movement, as and for the purpose set forth.

Second, The arrangement of the crank shaft, G, slotted uprights, I I, plate, F, roller, J, and the belts, j k, or their equivalents, all being arranged substantially as shown for the purpose of giving the proper movement to the pickers, d.

Third, In connection with the plates, E F, and pickers, d, the endless straps, M, blower or brush, L, and aprons, N N, arranged for joint operation, as and for the purpose set forth.

[The object of this invention is to obtain a simple and efficient machine for gathering cotton from the standing stalks, so as to supersede the usual manual operation. The invention consists in the employment or use of rotating pickers having a rising and falling and also a reciprocating movement, and used in connection with aprons and stripping belts.]

30,863.—H. H. Baker, of New Market, N. J., for an Improvement in Plows:

I claim, first, The mounting of the plowshares upon wheels arranged in the manner shown by B and C, through the medium of a frame, G, which slides vertically within, and is supported and guided by an exterior or principal frame A, as shown and described.

Second, Raising the plows, 1 and 2, vertically at will by the motion of the bearing wheel, C, through the aid of mechanism, substantially as set forth.

Third, The means substantially as shown and described for holding the forward side of the plow frame, G, higher than the rear side of the plow frame, G, higher than the rear side thereof when in the act of being elevated in combination with means substantially as shown and described for holding the said plow frame level when it is fully lowered for the purpose designated.

Fourth, In combination with the wheels, B and C, frame, A, plows 1 and 2, the employment of the spring, E, for the purpose designated:

Fifth, The employment of the adjustable standard, S, in combination with the spring, E, for adjusting the rigidity of the latter in manner and for the purpose shown.

Sixth, In combination with the adjustable spring, E, the employment of the wheel, M, for the purpose set forth.

30,864.—D. B. Bartholomew, of Lancaster, Pa., for an Improved Arrangement of Devices in Sawing Machines:

I claim the arrangement of the hinged support and rack, h, with the pressure roller, O, and adjustable bar, M, in the manner shown and described, so that, when the roller passes the end of the stuff, the support, N, will take to the rack, h, and prevent the roller from pushing the stuff against the saw, all as set forth.

I claim the arrangement, as shown and described, of the obliquely placed feeding roller, J, and adjustable gage, Q, with the platform, A, saw, G, levers, C C, shafts, D D, rod, F, and roller, O, all as shown and described.

[An engraving and description of this invention will appear in the next number.]

30,865.—D. Beal & W. W. Beal, of Lester, Iowa, for an Improvement in Seeding Machines:

We claim operating the seed slides, E, by means of the oval hubs, I, provided with the hook projections, f, the rods, O, provided with hooks, h, the springs, P and R, the pinion, K, and wheel, I, the latter being provided at its periphery with the toothed and smooth portions, and all arranged substantially as described.

[This invention consists in an improved arrangement of means for operating the seed slides by which the seed is distributed from the hoppers, and also in an improved arrangement of the furrow and covering shares, whereby the latter may be elevated, any one singly or all simultaneously, by the driver from his seat, and with the greatest facility.]

30,866.—Henry Bell, of Clinton, Ill., for an Improvement in Seeding Machines:

I claim the wheels, L L, provided with sliding bars, N, having screws, h, at their ends, which are fitted in the holes, i, of the wheels, in connection with the curbs, M, which encompass the wheels, all being arranged as and for the purpose set forth.

[This invention relates to an improved seed distributing apparatus and the means employed for operating the same. The invention also relates to a novel means for properly disposing the seed in the furrows. The object of the invention is to obtain a machine that may be used for planting seed either in hills or drills, and without the liability of having its seed distributing parts choked or clogged, and the seed properly distributed in the furrows.]

30,867.—Newton Benedict, of Aurelius, N. Y., for an Improvement in Swifts:

I claim a swift having the various parts constructed, arranged, combined and operating in the manner and for the purpose described.

30,868.—H. C. Boardman, of Morrisville, Vt., for an Improved Clothes' Drier:

I claim, first, The use of a waterproof sliding collar or hub, constructed as described, in combination with arms, B, or braces, D, when operated in the manner and for the purposes set forth.

Second, The method of folding the clothes' drier constructed with arms and braces, as described, by means of a loop in the line, G, passed around the pin, p, attached to the upper sliding collar, E, in the manner set forth.

30,869.—Theodore Briggs, of Philadelphia, Pa., for an Improvement in Explosive Harpoons:

I claim making an explosive harpoon lance to be thrown by hand, with its forward end constructed and applied to be exploded by the breaking of the wooden pin, e, as described, its barbs, f f, being pivoted together in the mortise, g, and turning outward on being released by the backward motion of the armed slide, i, as described, the whole being constructed and arranged to operate together in combination with the body of the implement, in the manner described and for the purpose specified.

30,870.—Jean Communy, of New Orleans, La., for an Improvement in Apparatuses for Applying Sulphurus Acid Gas in Purification of Cane Juice:

I claim the combination with the discharging pipe, F, of the receiving box, H, and conducting pipe, I, in the manner and for the purposes substantially as shown and described.

[This invention consists in so applying a steam pipe in combination with the pipe by which the fumes of sulphur are conveyed from the retort or furnace in which they are generated toward the box or vessel in which the juice is to be treated, that the fumes are forced among the juice by the agency of a jet of steam.]

30,871.—Horace Crofoot, of Tawboro, N. C,, for an Improvement in Seeding Machines:

I claim the arrangement of the roller, B, with the rotary harrows, L L, shaft, I, cylinders, M M, shafts, J I, and lever, N, in the manner shown and for the purpose set forth.

[This invention consists in a peculiar combination and arrangement of a roller and rotary harrows, whereby the whole area of the ground over which the machine passes will be fully acted upon and seed properly covered with pulverized earth, and the same rolled and compacted on the seed.]

30,872.—G. P. Evans, of Malden, Mass., for an Improved Clasp for Hooped Skirts:

I claim, as a new article of manufacture, a skirt hoop united at its ends, as described, by elastic or tubular caoutchouc clasps, constructed so as to operate substantially in manner and for the purpose as set forth.

30,873.—A. L. Dennison, of Waltham, Mass., for an Improved Method of Regulating Watches:

I claim the eccentric pin, 3, with its index hand, n, and graduated arc or dial, i, in combination with the regulating hand, D, and hair spring, C, arranged and operating in the manner set forth for the purpose specified.

30,874.—G. B. Field, of St. Louis, Mo., for an Improvement in Glass Coffins:

I claim the article of manufacture, viz., a coffin made of blown glass, composed of two or more pieces, in the manner substantially as described.

30,875.—James Fitton, of Cavendish, Vt., for an Improvement in Carding Engines:

I claim the combination of an endless traversing apron with the cylinder of a carding engine, operating substantially in the manner set forth.

30,876.—T. A. Galt, of Sterling, Ill., for an Improvement in Seeding Cultivators:

I claim attaching the seed box, I, to the cultivator, A, by means of the arms, N N, fitted on the pintles, h', and having the wheel, L, placed on the frame, M, which is attached to the bottom of the seed box, said wheel having the driving mechanism for the seed slide connected with it, in connection with the V-shaped draught bar, H, attached to the frame of the cultivator, and all arranged to operate as and for the purpose set forth.

[This invention relates to a novel arrangement of a seed distributing device and cultivator, whereby the two devices may work simultaneously or either be used separately, as may be required, and the devices, when combined, placed under the complete control of the attendant.]

30,877.—P. J. Hardy, of New York City, for an Improved Recumbent Chair:

I claim the reclining back, d, and hinged bottom, e, connected by the crank arms, 3, and links, 4, in the manner and for the purposes specified.

I also claim the stop, h, on the arm piece, r, passing through the slotted slide, g, and provided with the spring, 10, and projections, 8, to take the notches, 9, in the slide, g, as and for the purposes set forth.

30,878.—T. G. Harold, of Brooklyn, N. Y., and G. L. Kelty, of New York City, for an Improved Curtain Fixture:

I claim a blind or curtain roller fitted to receive a lateral or sideways motion at one end, by the action of the cord for connecting or disconnecting said roller from a stop, for the purposes specified.

30,879.—A. A. Hotchkiss, of Monroe City, Mo., for an Improvement in Water Drawers:

I claim the arrangement of the weight on the "bite" of the rope in connection with the bucket and cleet, d, in the manner described, so as to keep the weight out of the water entirely and the bucket from descending too low, so that neither of them shall rill the water when used in connection with the drawing apparatus described.

30,880.—Benjamin Jackson, of Louisville, Ky., for an Improvement in Cotton Cleaning Machines:

I claim the arrangement of the two rotary screens, B B, and aprons, D E, with the box, A, dust chamber, C, screen, H, and compressing rolling rollers, F F, in the manner and for the purposes shown and described.

30,881.—J. F. Keller, of Greencastle, Pa., for an Improvement in Water Elevators and Conveyors:

I claim the water carriage, D, in combination with the pendent portion of the rail, A, said carriage being provided with wheels which clasp the sides of the rail for the purpose of guiding the carriage when descending or ascending the well, substantially as set forth.

I claim the use of the tilting rails, B, in combination therewith, for the purposes set forth.

30,882.—S. A. Lindsay, of Unionville, Md., for an Improvement in Rakes for Harvesters:

I claim, in combination with a hinged platform and a hinged revolving reel and rake, the inclined shaft, P, and universal joint, q, for the purpose of retaining the rakes and reels in their proper relative positions to the platform when the latter is raised or lowered, substantially in the manner described.

I also claim attaching the rakes or reels to their respective arms by means of the links, n, and springs, O, substantially in the manner and for the purpose described.

30,883.—A. S. Markham and Daniel Markham, of Monmouth, Ill., for an Improvement in Corn Planters:

We claim securing the seed distributing slide, H, in proper position by means of the slides, J, in connection with the adjustable cut-offs, I, substantially as shown and described, to admit of the application or employment of seed slides of different thicknesses, to regulate as may be desired the quantity of seed to be planted on a given area or the number of seeds to be planted at a dropping.

[The object of this invention is to obtain a corn planter over which the driver may have perfect control, the corn planted at a greater or

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less depth, as may be required, and the cutters and shares elevated above the ground when the machine is being drawn from place to place; the device also admitting of the ready temporary elevation of the cutters and shares when the machine is being turned. The invention has further for its object the cutting of weeds, stalks and other trash that may lie in the path of the furrow and covering shares, thereby admitting of the perfect operation of the latter. The invention has lastly for its object the varying of the quantity of seed to be sown on a given area, by a simple adjustment of the seed distributing slide in its place, whereby slides of different thicknesses, and forming seed cells of varying capacity, may be used, as occasion may require, to effect the desired end.]

30,884.—Wm. H. H. Meillen, of Littleton, N. H., for an Improvement in Steam Plows:

I claim, first, The arrangement of the levers, G G, sliding pinions, f f, on shaft, F, and the gearing, I I k k, on the shafts, F J, essentially as shown, whereby the plows, K′, may be rotated or stopped instantly at the will of the operator or attendant.

Second, The arrangement of the levers, R R, with pawls, t, and lips, u, attached, the ratchets, Q, on the hollow shafts, N N, the clutches, p q, gearing, P, on the shafts, O, on which the hollow shafts, N, are placed, and the ropes or chains, n n, attached to the cross bar, M, of the arms, k, essentially as shown, for the purpose of elevating the shaft, J, and its plows, K′, when desired.

[This invention relates to an improved steam plow of that description in which rotary plows are employed. The object of the improvement is to obtain a light, portable and efficient plowing machine—one that may be readily manipulated, and the parts placed under the complete control of the operator or attendant.]

30,885.—Samuel Mowry and Eli Deppen, of Womelsdorf, Pa., for an Improvement in Corn Planters:

We claim, first The arrangement of the divided axle, F, the seed boxes, G G′, the disks, I I, tubes, O O′, springs, 8 8′, pinions, II II′ and N N′, shaft, M, pinion, L, spur wheel, K, and wheels, A A′—the several parts being constructed and connected substantially as and for the purpose specified.

Second, In combination with the subject of the first claim, we claim the lever, E, bridle, Q, furrowing tubes, P P′, covering hooks, R R′, and tie rods, S S, arranged and used as and for the purpose specified.

30,886.—J. W. Lawrence (assignor to Henry Brewster, I. W. Lawrence and J. W. Britton), of New York City, for an Improvement in Road Wagons:

I claim attaching the side bar to the body of the wagon by a rigid central and two elastic supports, when the side bar is so formed that it may have elasticity between the central and the side supports, as set forth

30,887.—B. Picquet, of Augusta, Ga., for an Improvement in Machines for Sowing Fertilizers:

I claim the arrangement of the right and left screw, B, variable driving cones, g g, apertures, e, and partitioned hopper, A, with the slotted beam, D, wheel, F, and adjustable plow and standard, G G′, as and for the purpose shown and described.

[This invention is an improvement in machines for scattering guano or other fertilizers, and for sowing seed either broadcast or in drills. It consists in the use of a peculiar shaped hopper, with a suitable number of holes in its bottom, over which holes a right and left screw shaft is placed, which is turned by cone pulleys, and a belt communicating with a wheel upon which the machine is mounted. The holes through the bottom of the hopper are furnished with plugs, so that, by stopping up some of them, the flow of guano or seed may be diminished, or, by opening all the holes, the guano may be scattered broadcast. Said scattering mechanism is furnished with a plow for loosening the earth and forming a furrow, and a scraper for covering up the fertilizer or seed and leveling the earth.]

30,888.—G. D. Sargent, of Boston, Mass., for an Improved Folding Bedstead:

I claim my improved folding bedstead or arrangement and connections of four sets, A A′ B C, of progressive levers, in the manner (without the intervention of separate posts) substantially as described.

I also claim, in its combination with such a folding bedstead, a covering chair, D, as constructed, with a chambered back opening into the space under the seat and between the legs, and to be applied to such bedstead in the manner as specified.

30,889.—Oswald Schevenell, of Marion, Ala., for an Improved Tenoning Tool:

I claim the portions, A A′ A′, the circular plate, B, with its elliptical hole, the parallel bars, D D, with the crescent pieces, b b, in combination with the knives, F F, knife boxes, E E, and their lugs, g g, and set screws, e e—all constructed, arranged and operating substantially in the manner and for the purposes set forth.

I also claim, in combination with the plate, B, and parallel bars, D D, the bar, H, with its centering point, k, when said bar is attached to the instrument substantially as and for the purposes specified.

[This invention consists in combining with a circulaar plate with a large elliptical hole through its center, and with a peculiarly shaped bit stock, to which said plate is secured, two parallel guide bars, which are connected together at their ends by crescent-shaped pieces, and which are fitted to the bottom of the circular plate and secured to the same by clamp screws, which screws, at the same time, secure the two cutting boxes in their proper places; said guide bars are furnished on their bottom surfaces and at the middle of the length of each with dovetail grooves, for receiving and holding a bar carrying the centering point for guiding the cutters properly to their work at the commencement of the operation of forming the tenon.]

30,890.—J. V. H. Secor, of New York City, for an Improvement in Seeding Machines:

I claim, first, Elevating and depressing the front part of the frame, A, by means of the eccentric, D, fitted in the back part of the draught pole, and arranged essentially as and for the purpose set forth.

Second, The arrangement of the adjustable frame, F′, provided with the wheel, G, and connected with the platform or foot piece, H, as and for the purpose specified.

Third, The levers, K K, bars, l, slides, L, boxes, N, and sides, a*, of the hoppers, arranged and combined to operate as and for the purpose set forth.

Fourth, In connection with the levers, K, slides, L, and boxes, N, the bars or levers, O, arranged to operate conjointly with the parts aforesaid, for the purpose specified.

Fifth, The arrangement of the furrow shares, Q, with the shafts, R, and bars, S, as and for the purpose set forth.

Sixth, The arrangement of the covering shares, T T, with the shafts, U U, springs, W W, adjustable pendants, X, and buttons, Y, as and for the purpose set forth.

[This invention relates to an improved seeding machine of that class which are used for planting seeds in hills or drills, and in check rows, when required. The invention consists in an improved seed distributing arrangement, and parts pertaining to the operating of the same, and to an improved arrangement of the furrow and covering shares; and also to an improved means of elevating and lowering the front part of the machine. The object of the invention is to obtain a simple and efficient device for the desired purpose, and one that will be under the perfect control of the driver and readily manipulated.]

30,891.—Richard Solis, of New Brunswick, N. J., for an Improvement in Machines for Making Shirred Goods:

I claim, first, Arranging the toothed guide, b, in machines for manufacturing shirred or other elastic goods, down close to the revolving guide, J, as and for the purpose specified.

Second, The pivoted guide, a b e, constructed, arranged and operating substantially as and for the purposes set forth.

[This invention consists in arranging the toothed guide in shirring machines down close to the revolving guide, and in making the said toothed guide adjustable for convenience in threading it.]

30,892.—Oliver Sparks, of Shelbina, Mo., for an Improvement in Plows:

I claim the two plows arranged one in front of the other, as and for the purposes set forth, in combination with the levers, F G′ H and G, arranged, supported and operating as described.

[This invention is an improvement in trench plows, and consists in combining, in a novel manner, a breaking or sod plow with a trench or subsoil plow, whereby both plows may be thrown into or out of the ground simultaneously. The principal object of the invention is to more perfectly bring the subsoil to the surface and cover up the sods or surface soil.]

30,893.—J. D. Squires, of Cold Spring, N. Y., for an Improvement in Apparatuses for Raising Water:

I claim the ring, I, either plain or provided with depressions, c c, attached to the bucket by ears, b b, or their equivalent, and leaving a space between the bucket and the ring, when the same is used in combination with the tilting rod, H, substantially as set forth.

I also claim the wedge piece, N, provided with the wedge-shaped arms, i and k, and intermediate space, l, in combination with the hinged brake, L, acting on the windlass, substantially as described.

30,894.—E. S. Taylor and H. S. Larned, of Cleveland, Ohio, for an Improvement in Water Elevators:

We claim the rib, L′, spirally inclined planes, J J, and niche, I, for facing the spout of the bucket, O, to the spout, B, of the curb, as specified, and in combination therewith, we claim the special arrangement of the lip, H, and box, K, for the purpose set forth.

30,895.—J. K. Taylor, of Bridgeport, Conn., for an Improved Bolt Cutter:

I claim holding on to or against the nut whilst the cutter is being actuated by the lever, instead of the bolt, for the purpose of leaving that part of the bolt that is to be cut off free from any resistance on the side opposite to the cutter, substantially in the manner and for the purpose set forth.

30,896.—J. C. Tilton, of Sanbornton Bridge, N. H., for an Improvement in Temples:

I claim inserting the teeth, c c, into a removable piece of wood, C, fitted and secured in the plate, A, substantially as and for the purpose specified.

30,897.—Benjamin Tinkham, of Cameron, Ill., for an Improvement in Cultivators:

I claim, first, The combination with the axle, B, and plates, c d, of the beams, E, plates, a b, and pins or bolts, f, substantially as and for the purposes set forth.

Second, In combination with the above, I claim the pins or supports, h, with the hounds, D, as and for the purpose described.

30,898.—P. D. Van Hoesen, of New York City, for an Improved Washing Machine:

I claim the combination of the triangular-shaped tub, A, with the reversible washboard, C, constructed and operating substantially in the manner and for the purpose set forth.

[This invention consists in the arrangement of a triangular wash tub, in combination with a reversible washboard, in such a manner that said washboard can be used either for the purpose of pounding the clothes or in the ordinary manner for hand washing.]

30,899.—F. W. Willard, of New York City, for an Improvement in Vapor Lamps.

I claim the combination of the plate, K, strip of metal, I, and the wire, J, constructed and operating for the purposes and uses substantially as set ferth in the specification.

30,900,—J. J. Watson, of Buffalo, N. Y., for an Improvement in Tapping Gas and Water Pipe:

I claim, first, The employment of the wheel, B, provided with holes, D C E, and divided in two parts through its periphery, substantially as and for the purpose specified.

30,901.—John Adt, (assignor through mesne assignments to Wm. B. Barnard), of Waterbury, Conn,, for an Improved Knob Lock:

I claim the arrangement of the spring, c, and a ring, g, that is provided with a depression, i i, lugs, h h, and slot, i, with the shank, E, box, d, pin, a, and notched rose, C, as shown and described for the purposes set forth.

[This invention consists in applying to the shank of an ordinary knob a peculiarly shaped ring, with lugs projecting from one edge, which lugs fit into corresponding notches cut into the flange of the nose and keep the knob from turning when it is desired to lock the door, and when the knob is to be left free to turn, this ring can be set back and secured.]

30,903.—A. J. Kramer (assignor to himself and Benjamin Reece and N. W. Claflin), of Marion, Iowa, for Improved Arrangements of Parts in Rotary Planers:

I claim the arrangement of the vertically sliding rotary planer, G, with the carriage, I, adjustable clamp frame, J, clamp, K, eccentric, L, jaws, l l m, and screws, M M M′, as and for the purpose herein shown and described.

30,904.—S. A. Worthen (assignor to himself and Wm. Walker), of Morrisville, Vt., for an Improvement in Cross-cut Sawing Machines:

I claim the spring ratchet, D, arm, I, lever, L, weight, W′, and arm, H, in combination with the reciprocating saw and frame arranged and operating substantially as and for the purpose set forth.

RE-ISSUES.

T. J. Mayall, of Roxbury, Mass., assignor, by mesne assignments, to J. H. Cheever, of New York City, for an Improvement in the Manufacture of Hard Rubber. Patented November 30, 1858:

I claim the use of fatty substances formed in or derived from organic matter or vegetable origin, when incorporated with the rubber compound in the manufacture of hard vulcanized rubber, as described for the purpose or purposes specified.

G. W. Brown, of Galesburg, Ill., for an Improvement in Seed Planters. Patented May 8, 1855. Reissued November 10, 1857:

I claim, first, In combination with a seed planting machine that is operated by hand, the placing of both the driver and the person who operates the seed slides or valves upon the machine in such position as that each may attend to his particular duty without interfering with that of the other, substantially as described.

Second, I also claim, in combination with a seed planting machine that is operated by hand and upon which the driver and the person who works the seed slides or valves sit or stand, the so locating of said seats or stands as that the weight of one of the persons may be used to counterbalance or overbalance the weight of the other, for the purpose of more readily raising or lowering the seeding apparatus, substantially as and for the purpose described.

G. W. Brown, of Galesburg, Ill., for an Improvement in Seed Planters. Patented May 8, 1855. Reissued November 10, 1857:

I claim in combination with a seed planting machine operated by hand and having its seeding devices forward of the center of the wheels, and forward of the driver's seat, and a hinged connection, the locating of the seat in such relation to a line drawn through the centers of the wheels or ground supports as that the occupant of said seat may, by moving himself or throwing his weight forward or backward on his seat, without the necessity of rising, walking or standing over or near the seeding devices, force the seeding apparatus into, or raise it from the ground, substantially as described.

G. W. Brown, of Galesburg, Ill., for an Improvement in Seed Planters. Patented May 8, 1855. Reissued November 10, 1857:

I claim, in combination with a seed planting machine that has a hinged or yielding joint between its fixed points of support, and with its seeding devices between said points, the so connecting of the parts between said fixed points of support as that that portion of the machine carrying the seeding devices may be raised up and out of the ground by the attendant riding on the machine, and be carried by the tongue or horse necks and the supporting wheels, substantially as and for the purpose described.

G. W. Brown, of Galesburg, Ill., for an Improvement in Seed Planters. Patented May 8, 1855. Reissued November 10, 1857:

I claim, in combination with a seed planting machine so made as that the forward part of the machine can be raised up on to the supporting wheels, and there carried, a lock, block, or stop, h, which prevents the rear part of the frame from descending so low as to strike the ground or inconvenience the occupant of the seat upon said rear portion of the frame, substantially as and for the purpose described.

G. W. Brown, of Galesburg, Ill., for an Improvement in Seed Planters. Patented May 8, 1855. Reissued November 10, 1857:

I claim so combining with a lever by which both may be operated, a valve or slide in the seed hopper and a valve in the seed tube, as that a half motion of the lever by the operator riding on the machine by which they are operated shall both open and close the seed passages at regular periods and in measured quantities only, substantially as described.

J. J. Johnston, of Allegheny City, Pa., for an Improvement in Corn Shellers. Patented April 19, 1859:

I claim, first, The combination and arrangement of the two shelling disks running on the same plane, in opposite directions, as described and for the purpose set forth.

Second, The combination of the said disks with guide, spring or press plates, or their equivalents, as described and for the purpose set forth.

D. E. Somes (assignor to J. S. Anderson), of Biddeford, Maine, for an Improvement in Curing Provisions. Patented November 13, 1860:

I claim salting and curing food and hides in any latitude and at times when the temperature of the surface of the earth is too high for the ordinary process, by means of operating in excavations or shafts made in the earth to a depth sufficient to attain the mean temperature of the earth or to a depth at which meats have not heretofore been salted and cured, and further to cool by artificial refrigeration, substantialty as set forth.

C. T. James, of Providence, R. I., for an Improvement in Projectiles. Patented February 26, 1856:

I claim the employment of an expansible packing surrounding the projectile and so combined therewith, substantially as described, that the force of the discharge acting on the inside of such packing shall force it outward against the bore of the gun and into the grooves thereof, if the gun be rifled, substantially as described.

ADDITIONAL IMPROVEMENT.

T. G. Chase, of Philadelphia, Pa., for an Improvement in Rendering Fabrics Incorrodible. Patented Nov. 9, 1858:

I claim the interposing of a mixed powder of calcined feldspar sulphate of lime with the metallic oxyds of magnesium, calcium and iron between the block of caustic alkali coated with paraffine and the paraffine wrapper.

I also claim the composition of paraffine and rosin for the purposes described.

NOTE.—The above list of claims does not compare favorably with the number issued last week. There were issued on Tuesday, 4th inst., SEVENTY-THREE patents; while the above list, issued December 11th, numbers only FORTY-THREE, which is not as many cases as were filed into the Patent Office through our agency alone, during the same week. Among the above-named patentees we recognize NINETEEN, or nearly one-half of the entire number, as persons who procured their Letters Patent through the Scientific American Patent Agency.

NEW BOOKS AND PERIODICALS RECEIVED

CASSELL'S ILLUSTRATED BIBLE. New York: Cassell & Co., No. 37 Park-row.

We are gratified to be able to state that the demands for this truly magnificent work are constantly increasing, and that thousands of copies of each number find sales as fast as issued. We have before had occasion to call attention to the first of the bound volumes, which embraces the Scriptures from Genesis to Samuel. The work is profusely illustrated, and forms an incomparable gift book for the holidays.

MUSIC—"Virginia Polka" and "Oliver Gallope." New York: Horace Waters, No. 333 Broadway.

The powers to compose and execute music are rare gifts, and, in some instances, they are bestowed where we would least expect to find them. Two pieces of music, bearing the above titles, have been sent to us by the publisher, said to be composed by a blind negro boy only ten years of age, who is a musical prodigy, being capable of executing the most difficult pieces of music on the piano, after hearing them performed only once.

THE SONGS OF IRELAND; edited by Samuel Lover. New York: Dick & Fitzgerald, No. 18 Ann-street.

Some of the sweetest song-music in the world is, undoubtedly, Irish. Perhaps we might add that some of the most touching songs in our language belong to the same nation. Moore's name will certainly live in the memory of all the lovers of song, when the great majority of other names of celebrity in the same sphere of art will be forgotten. Lover himself, the editor of this volume, has wedded his name to immortality in the "Angel's Whisper." Lady Dufferin wrote, "I'm Sitting on the Stile, Mary;" Sheridan, Carolan, O'Keefe, Davis, and many others, occupy a place in the famous catalogue.

OLD FRANLIN ALMANAC, for 1861. Philadelphia: A. Winch, No. 320 Chestnut-street.

This publication is crowded with interesting and valuable information—such as the force and number of the navies of the world, an

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estimate of the average rate of wages in the United States, area of the Western Territories and of the States, weights and measures of the United States and other countries, &c., &c.

THE ILLUSTRATED FAMILY REGISTER OF RURAL AFFAIRS AND CULTIVATOR ALMANAC, for 1861. Albany: Luther & Son.

This volume contains practical suggestions for the farmer and horticulturist, and is embellished with over 140 illustrations. It is edited by John J. Thomas, author of the "American Fruit Culturist," &c., and associate editor of "The Country Gentleman" and "The Cultivator." Price, 25 cents.

NORTH BRITISH REVIEW. New York: Leonard Scott & Co., No. 54 Gold-street.

The number for this quarter contains several able papers on various subjects. One—on "American Humor"—is decidedly able: another—on "The Martyrdom of Galileo"—is of thrilling interest to men of science and the lovers of truth.

HIDE AND SEEK—A novel; by Wilkie Collins. New York: Dick & Fitzgerald, No. 18 Ann-street.

We are indebted to the above firm, the American re-publishers, for a copy of the much-talked-of novel, "Hide and Seek," by the great English romancist, Wilkie Collins, author of the "Dead Secret," the "Woman in White," &c. Price, 50 cents.

ETIQUETTE; edited by Henry P. Willis. New York: Dick & Fitzgerald, No. 18 Ann-street.

This volume contains the most approved rules for correct deportment in fashionable life. If any of our mechanics or inventors desire to make a mark in snobbish society, let them study these hints.

BOOKS FOR CHILDREN.—We find, on the approach of Christmas, our table well supplied with books adapted to the instruction and amusement of the young. Of late years, much attention has been devoted by authors to this branch of literature. We are glad to notice this fact, and would encourage mechanics to spend a little of their earnings for the benefit of their children in the way of interesting and entertaining publications. Messrs. Crosby, Nichols & Lee, of Boston, have published the "Little Frankie Stories:" also, the "Little Robin's Nest," by Mrs. Madaline Leslie. Six volumes in each set, making twelve books—beautifully printed, and well illustrated. These books are most excellent, and we can recommend them highly.

HALL'S JOURNAL OF HEALTH begins a new volume on January 1, 1861; $1 a year. Address box No. 3,349, New York Post Office.

Notes and Queries

J. F. R., of Pa.—The machine for drilling the Hoosac tunnel is driven by a steam engine. A number of drills are operated at once; these receive a motion on their vertical axes as they are struck by the hammers. You will find a drilling machine illustrated on page 153, Vol. III. (old series) of the SCIENTIFIC AMERICAN.

D. R., of N. C.—"Carbon oil," so called here, is not made from rosin tar, we believe, but from coal. The way to burn rosin tar, to obtain lampblack, is to place it in a furnace and burn it with a small amount of air, conducting the smoke into cylindrical chambers hung with coarse bags, upon the surface of which the lampblack is deposited.

J. P. S., of Ky.—A magnetic, locomotive driving wheel would not be patentable in itself, but there may be some feature of a patentable character in the details of its construction. When you send the model we shall be able to give a more definite opinion. Superheated steam can be used expansively with as much advantage as saturated steam, so far as we can judge from the statements of those who have thus employed it.

D. C., of N. Y.—There is nothing patentable about the sulphur vapor bath, as far as we have been able to ascertain.

A. W., of Conn.—You will find a full illustrated description of the processes and compositions for enameling iron on page 182, Vol. IX. (old series), of the SCIENTIFIC AMERICAN. It would take up too much of our time to describe the processes by letter.

L. K. W., of Va.—The SCIENTIFIC AMERICAN is the only source where you can obtain information respecting the general progress of invention for the past 15 years. You will find an electric lamp illustrated on page 404, Vol. VIII. (old series).

T. H., of Mo.—As we understand your question, it will take the same amount of power to drive a pinion placed at any part of the inside rim of a large spur wheel rolling on the ground. To balance the resistance to the large wheel, however, it would be the most suitable position to set the pinion directly in line above the point of contact, where the wheel touches the ground.

J. B. S., of Wis.—In laundries, mangles are employed for pressing sheets and other kinds of domestic linen. The fine gloss is put upon collars and bosoms with the iron rubbed on rapidly while hot. The collars are placed on a hard surface of pasteboard, and they require a good body of starch containing a minute quantity of sperm.

S. C., of Va.—The needle will dip in proportion to its nearness to the magnetic poles. A due north line is not that of the maximum dip of the needle at present. The magnetic pole is at a point about 10° from the north pole. By changing the magnetic meridian east or west, the dip of the needle varies accordingly, and it is continually changing. The magnetic poles seem to have a slow revolution round the true poles of the earth.

W. R. A., of Penn.—A horse-power is power sufficient to raise 33,000 lbs. one foot high in one minute. A column of water, 20 inches in diameter and 56 feet long, contains 122.17 cubic feet, and weighs, at 62½ lbs. to the cubic foot, 7,665 lbs. To raise this weight 240 feet requires 1,839,600 foot pounds, and to accomplish this work during each minute would require 55 4-5 horse-power. A single acting engine, with a cylinder 38 inches in diameter and 6 feet stroke, making 20 strokes per minute, with steam at 100 lbs. pressure, would give a gross yield of 550 horse-power; deducting ⅓ for friction, &c., and we have a net power of 413 horses.

W. P. H., of Ill.—Your method of supplying a continuous stream of mercury to Way's electric light is ingenious, and we believe it is also patentable.

P. M., of C. W.—You can purchase the colors for graining oak at any good paint store. These colors are made of sienna, umber and Vandyke brown. They are put on a lighter ground, and the streaks and wave lines are made by removing portions of the coating with a piece of soft leather or rags placed upon the artist's finger. A woolen comb is employed to make the fine streaks or grains. It requires much skill and good taste to be a first rate grainer of wood.

J. P., of Ala.—An excellent cement for slabs of marble is made by steeping plaster of Paris in a strong solution of alum, then drying and calcining it, after which it is reduced to powder and is fit for use by mixing with water. This cement becomes very hard, but is not adapted for exposure to the weather. It is useful for setting the tiles and slabs of tesselated pavements, and may be employed as a substitute for stucco in making plaster ornaments. We cannot give you the information requested about the nitrate of the oxyd of glycerine.

J. G., of C. W.—The cost for an English patent is the same to a British subject as to any American citizen. A good metal for making models is 20 ounces copper to 10 of tin. It is sufficiently tough and is easily worked. It is necessary to put rollers in your model and render every part complete on which any claim is to be based.

J. M. G., of N. Y.—Though there is great difference of opinion about the time of the first olympiad, chronologers agree to reckon from the one the first year of which was the 776th before Christ. Consequently, this is the 659th, as you say. As Professor Pierce, of Cambridge, is interested in the "American Nautical Almanac," if you will write to him, he will inform you where you can procure it.

C. A. B., of N. Y.—Benzole is to be had in this city at $1.25 per gallon.

G. D. G., of N. Y.—The alloy of all the United States silver coins consists of nine parts of silver to one of base metal. The weight of the three cent piece is 11 52-100 grains.

C. W. B., of N. Y.—The statement that a caloric engine could be run with an expenditure of a half pound of coal per horse-power per hour was probably intended to be understood as theoretical. We do not believe that this has ever been realised.

W. W., of Ind.—As the axle of the gyrascope is supported at one end, the revolving disk at the opposite end cannot fall without changing the plane of its rotation; but as gravity overcomes the resistance offered by the inertia of the rotating disk to this change of plane, the effort to preserve the same plane of rotation causes the revolution around the center.

S. D. S., of Tenn.—You will find articles on the reforming of our weights and measures on pages 54 and 70 of the present volume of the SCIENTIFIC AMERICAN.

D. W., of Ill.—We do not know anything better to prevent polished iron work from rusting and turning black than common clear varnish, containing a little bleached beeswax. Clear copal varnish is very good of itself for the purpose, because it contains linseed oil.

J. M. L., of Mich.—The paper for Bains' chemical telegraph was prepared with the prussiate of potash and a small quantity of the chloride of calcium. The latter kept the paper in moist condition. We are not acquainted with any good reason why the chemical telegraph was abandoned. You will find the best modes of constructing batteries described in Prescott's able work on the telegraph.

S. R. K., of Mich.—The following is a simple rule to ascertain the nominal horse-power of a common condensing engine:—"Multiply the square of the diameter of the cylinder in inches by the cuberoot of the stroke in feet, and divide the product by 47; the quotient is the number of nominal horses-power of the engine." This rule assumes the existence of a uniform effective pressure upon the piston of 7 lbs. per square inch. The actual power of an engine can only be ascertained by the use of an indicator attached to the cylinder, to indicate the amount of pressure or vacuum existing within the cylinder. About one pound and a half of the pressure per square inch is allowed for friction, working the air pump, &c., expended on the engine itself.

MONEY RECEIVED

At the Scientific American Office on account of Patent Office business, for the week ending Saturday, Dec. 15, 1860:—

P. R., of Ill., $15; J. H., of Conn., $30; H. T. S., of Mich., $25; S. M. D., of Tenn., $33; W. H. G., of N. Y., $25; W. M., of N. Y., $50; D. M., of Ohio, $25; E. G. P., of N. Y., $150; J. C. A., of Md., $30; J. S. & J. W. H., of Ill., $25; J. P., of Texas, $55; A. H. & C. R. B., of Ind., $30; J. H., Jr., of Vt., $30; P. D. Van H., of N. Y., $55; A. A., of N. Y., $12; W. L. F., of N. J., $25; J. B. C., of N. Y., $12; O. S., of Conn., $30; W. M. & C. W. H., of Maine, $30; W. J. G., of Conn., $55; D. H., of Ala., $25; F. P., of Tenn., $25; J. B., of Texas, $25; C. & L., of N. Y., $30; P. S., of N. Y., $25; O. C. T., of Pa., $30; G. P. R., of Mass., $10; M. P. H., of Ohio, $20; R. R. L., of N. Y., $55; C. W. J., of Conn., $55; W. H. D., of Ill., $35; G. F. J. C., of N. J., $25; J. L. Y., of N. Y., $12; W. D. L., of N. Y., $25; E. G., of N. Y., $30; E. C., of Ohio, $30; W. H. S., of Ill., $25; W. Y., of Ind., $10; W. D. L., of N. Y., $50; H. S. W., of Mass., $30; A. J. G., of Mass., $25; P. L. W., of Pa., $30; R. L. U., of N. Y., $12; C. C. F., of Mass., $25; B. & S. I. L., of Maine, $30; O. B., of N. Y., $25; W. J. G., of Conn., $25; W. R. A., of Ill., $25; J. S. C., of N. Y., $25.

Specifications, drawings and models belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, Dec. 15, 1860:—

J. H., Jr., of Vt.; P. R., of Ill.; H. G. N., of N. Y.; J. B., of Texas; J. W. F., of Pa.; G. F. J. C., of N. J.; J. L. Y., of N. Y.; D. M., of Ohio; S. W. M., of N. Y.; P. S., of N. Y.; J. W. & J. S. H., of Ill.; E. P. T., of N. Y.; C. W. J., of Conn.; A. G. M., of N. Y.; T. F. B., of Vt.; O. E., of N. Y.; A. A., of N. Y.; D. H., of Ala.; W. H. S., of Ill.; W. M. B., of Ind.; J. S. C., of N. Y.; W. L. F., of N. J.; J. B. C., of N. Y.; C. C. F., of Mass.; P. D. Van H., of N. Y.; H. T. S., of Mich.; J. P. S., of N. Y.; W. H. G., of N. Y.; F. P., of Tenn.; W. J. G., of Conn.; W. R. A., of Ill.; D. H. T., of N. Y.; A. J. G., of Mass.; W. D. L., of N. Y.; R. L. U., of N. Y.; J. G., of Ky.

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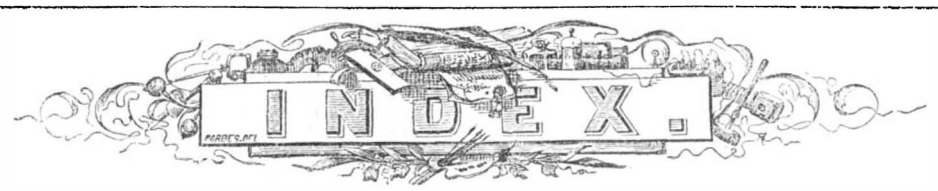

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